

Daily report 13-11-2020

Analysis and prediction of COVID-19 for EU-EFTA-UK and other countries

Situation report 154

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With the financial support of



and



Foreword

The present report aims to provide a comprehensive picture of the **pandemic situation of COVID-19** in the EU countries, and to be able to foresee the situation in the next coming days. We provide some figures and tables with several **indexes and indicators** as well as an **Analysis** section that discusses a specific topic related with the pandemic.

As for the predictions, we employ an **empirical model**, verified with the evolution of the number of confirmed cases in previous countries where the epidemic is close to conclude, including all provinces of China. The model does not pretend to interpret the causes of the evolution of the cases but to permit the **evaluation of the quality of control measures made in each state** and a **short-term prediction of trends**. Note, however, that the effects of the measures' control that start on a given day are not observed until approximately 7-14 days later.

We show an individual report with 8 graphs and a summary table with the main indicators for different countries and regions. We are adjusting the model to **countries and regions** with at least 4 days with more than 100 confirmed cases and a current load over 200 cases.

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These reports are funded by the European Commission (DG CONNECT, LC-01485746)

PJC and MC received funding from "la Caixa" Foundation (ID 100010434), under agreement LCF/PR/GN17/50300003; CP, DL, SA, MC, received funding from Ministerio de Ciencia, Innovación y Universidades and FEDER, with the project PGC2018-095456-B-I00;

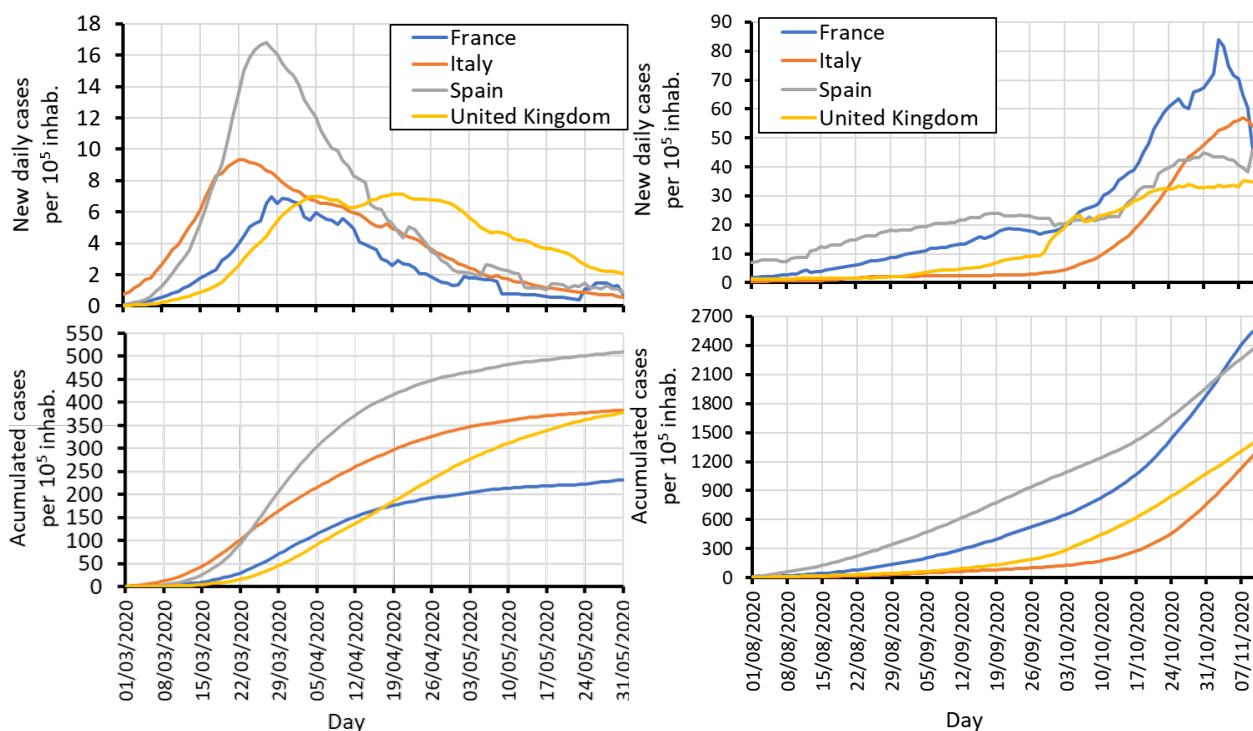
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Situation and highlights

Global situation

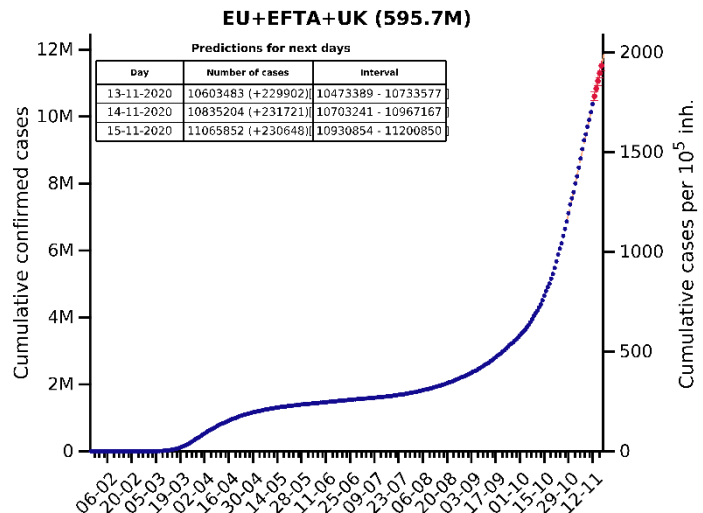
At the moment one of the important debates is to assess which states or regions have done and are doing better epidemiological control, especially in this second wave where control policies are diverse. We will be able to make the answers with objective criteria when everything that has happened and is happening can be evaluated. What should not be done is to evaluate only on the basis of the epidemiological situation at a given time. The epidemiological situation today is a picture of what is happening, it is more interesting to watch the film, that is, the evolution over time. As an example, we

compare four of the most populous states that have been severely affected both in the first wave and in the present one. In the graph of new daily cases we can easily see that what really matters is not the peak value which gives the maximum number of daily cases but the areas below the curves, which represent the cumulative number of cases.



During the first wave Spain was much more affected than the other three countries, and France is the one that was least affected. In the second wave, it is not yet possible to evaluate what the final result will be, we can only compare the routes so far. France and Spain have a number of people affected per 100,000 inhabitants similar to those observed in UK and Italy. However, this is the snapshot right now. If we look at the global evolution, we observe that the trajectory and the global situation is way worse in Spain and France than in Italy and UK. The total number of cumulative cases, this means the area under the curve of new cases, is clearly higher in France and Spain than in Italy and UK. France and Spain present around 2500 cumulative cases per 100,000 inhab. while the UK and Italy half this value.

We must emphasize that the number of cases accumulated per 100,000 inhab. is only one of the parameters to be considered when evaluating the success in the management of the pandemic. However, it is important

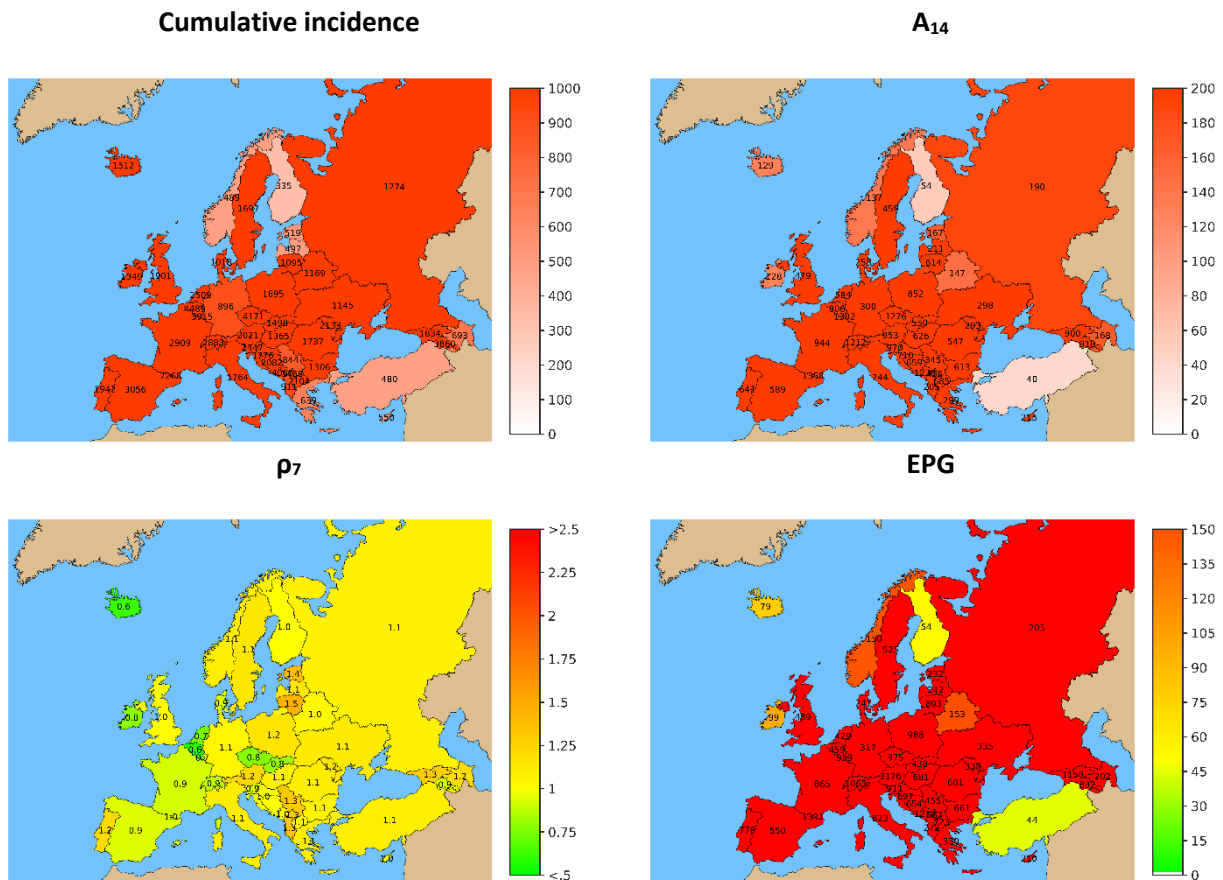


to state that single-point measures in time must not be a basic criterion to assess the situation. In this regard, cumulative cases give an indication of the full picture.

Situation and trends per country

Maps of current situation in EU countries. Colour scale is indicated in each legend.

- Cumulative incidence: total number of reported cases per 100,000 inhabitants
- A_{14} : Cumulative incidence last 14 days per 100,000 inhabitants (active cases)
- ρ_7 : Empiric reproduction number
- EPG: Effective Potential Growth ($EPG = A_{14} \cdot \rho_7$)



Tables of current situation in EU countries. Colour scale is indicated in each legend.

Incidence, mortality and epidemiological indexes.

Country	Reported data						Indexes		
	14-day attack rate /10 ⁵ inh.	Active cases (last 14 days)	Attack rate /10 ⁵ inh.	Cumulative cases	Mortality /10 ⁵ inh.	Cumulative deaths	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
Luxembourg	1,301.8	8,149	3,914.7	24,505	32.9	206	0.74	959	9
Czech Republic	1,275.6	136,607	4,171.0	446,675	53.7	5,755	0.76	975	9
Switzerland	1,212.2	104,913	2,882.5	249,471	33.1	2,863	0.88	1,065	9
Liechtenstein	1,151.1	439	2,425.5	925	10.5	4	0.97	1,122	9
Slovenia	970.0	20,165	2,446.9	50,870	21.0	437	0.94	911	9
Austria	953.3	85,862	2,021.5	182,062	16.8	1,510	1.23	1,176	9
France	943.6	615,941	2,908.9	1,898,710	65.8	42,960	0.92	865	9
Poland	851.6	322,291	1,695.0	641,496	24.0	9,080	1.16	988	9
Belgium	806.0	93,410	4,489.3	520,297	119.9	13,891	0.57	459	9
Italy	744.0	449,806	1,763.8	1,066,401	72.1	43,589	1.11	823	9
Croatia	710.0	29,147	1,776.3	72,922	22.5	925	0.98	697	9
Portugal	641.3	65,395	1,941.9	198,011	31.2	3,181	1.21	776	9
Hungary	626.0	60,474	1,365.2	131,887	29.8	2,883	1.09	681	9
Lithuania	614.3	16,724	1,095.1	29,812	9.0	244	1.45	893	9
Bulgaria	612.7	42,575	1,305.7	90,725	28.4	1,970	1.08	661	9
Spain	589.3	277,137	3,056.2	1,437,220	86.0	40,461	0.93	550	9
Netherlands	584.0	100,066	2,509.1	429,938	48.4	8,294	0.73	429	9
Slovakia	550.3	30,044	1,497.8	81,772	8.5	464	0.80	438	9
Romania	546.8	105,196	1,737.4	334,236	44.2	8,510	1.10	601	9
United Kingdom	478.5	324,855	1,900.5	1,290,195	75.0	50,928	1.02	489	9
Sweden	459.2	46,379	1,696.8	171,365	60.6	6,122	1.14	525	9
Malta	403.1	1,780	1,731.7	7,646	19.9	88	0.96	385	9
Germany	300.1	251,401	896.5	751,095	14.6	12,200	1.06	317	9
Greece	298.6	31,127	639.3	66,637	9.2	959	1.10	330	9
Denmark	257.7	14,929	1,018.0	58,963	13.0	755	0.93	241	9
Cyprus	214.9	2,595	550.5	6,646	2.8	34	0.98	210	9
Latvia	211.3	3,986	497.3	9,381	5.7	107	1.15	242	9
Estonia	166.6	2,210	518.7	6,881	5.7	76	1.39	232	9
Norway	137.2	7,437	488.9	26,503	5.4	291	1.09	150	8
Iceland	129.2	441	1,512.1	5,160	7.3	25	0.61	79	7
Ireland	128.3	6,335	1,349.4	66,632	39.8	1,965	0.77	99	7
Finland	53.7	2,976	334.6	18,542	6.6	365	1.00	54	6

Colour scale								
>150.0	Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>150
0.0	Best	Best	Best	Best	Best	Best	0.0	0

Table of current situation in some EU provinces. Colour scale is indicated in each legend.

Province	Reported data						Indexes		
	14-day attack rate /10 ⁵ inh.	Active cases (last 14 days)	Attack rate /10 ⁵ inh.	Cumulative cases	Mortality /10 ⁵ inh.	Cumulative deaths	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
Brussels	1,086.6	13,126	5,899.8	71,270	174.0	2,102	0.62	670	9
Bern	925.4	9,578	1,891.9	19,581	17.1	177	1.02	940	9
Wien	706.8	13,408	2,201.8	41,768	22.6	429	0.94	667	9
Lazio	587.4	34,532	1,338.1	78,665	27.0	1,586	1.06	622	9
Lisbon	580.9	16,458	2,539.2	71,936	41.7	1,181	1.14	660	9
North Holland	580.3	16,556	2,764.4	78,868	39.9	1,137	0.80	463	9
Berlin	397.7	14,990	1,114.7	42,014	8.3	314	1.07	427	9
Madrid	356.5	23,672	4,858.4	322,631	162.8	10,808	0.87	310	9
London	306.2	27,438	1,327.3	118,936	NA	NA	1.04	317	9

Colour scale								
>150.0	Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>150
0.0	Best	Best	Best	Best	Best	Best	0.0	0

⁽¹⁾ ρ_7 is the average of 7 consecutive ρ , but can still fluctuate. ⁽²⁾ EPG stands for Effective Growth Potential, which is the product of reported cumulative incidence of last 14 days per 10⁵ inhabitants by ρ_7 (empiric reproduction number). Biocom-Cov degree is an epidemiological situation scale based on the level of last week's mean daily new cases (<https://upcommons.upc.edu/handle/2117/189661>, <https://upcommons.upc.edu/handle/2117/189808>).

Situation of hospitalisations and ICUs in some EU countries. The analysis is done for those countries that report a historical series with current (active) number of patients in hospitals and ICUs¹. We provide:

- Current active hospitalisations and patients in ICU per 100,000 inhabitants.
- Current absolute number of active hospitalisations and patients in ICU.
- Rate of occupation of curative care hospital beds by Covid-19 patients (data from Eurostat 2018²), only for hospitalisations.
- Current rate of occupation with regards to the maximum Covid-19 occupation reached in this pandemic.
- Weekly increase in Covid-19 patients in hospitals and ICUs.

Country	Hospitalisations					Intensive Care Units			
	Active /10 ⁵ inh.	Active (total)	Occupation (Eurostat 2018) (%)	Occupation (historical maximum) (%)	Week-to-week Growth (%)	Active /10 ⁵ inh.	Active (total)	Occupation (historical maximum) (%)	Week-to-week Growth (%)
Hungary	69.3	6690	16.0	100.0	24.8	5.4	518	100.0	27.2
Belgium	60.5	7010	12.4	93.7	-1.4	12.5	1452	98.5	9.8
Slovenia	58.2	1210	14.1	100.0	23.7	9.6	200	99.0	28.3
Italy	54.7	33043	21.2	100.0	30.0	5.2	3170	77.9	31.1
France	48.9	31946	15.7	98.9	19.9	7.4	4803	68.0	20.7
Switzerland	45.3	3919	12.8	98.1	18.3	5.4	470	96.3	23.9
Austria	35.3	3183	6.7	100.0	43.2	6.0	536	100.0	39.9
Slovakia	33.8	1847	7.0	98.7	16.5	1.9	105	86.8	5.5
Portugal	27.4	2794	8.3	100.0	15.9	3.8	383	98.0	21.3

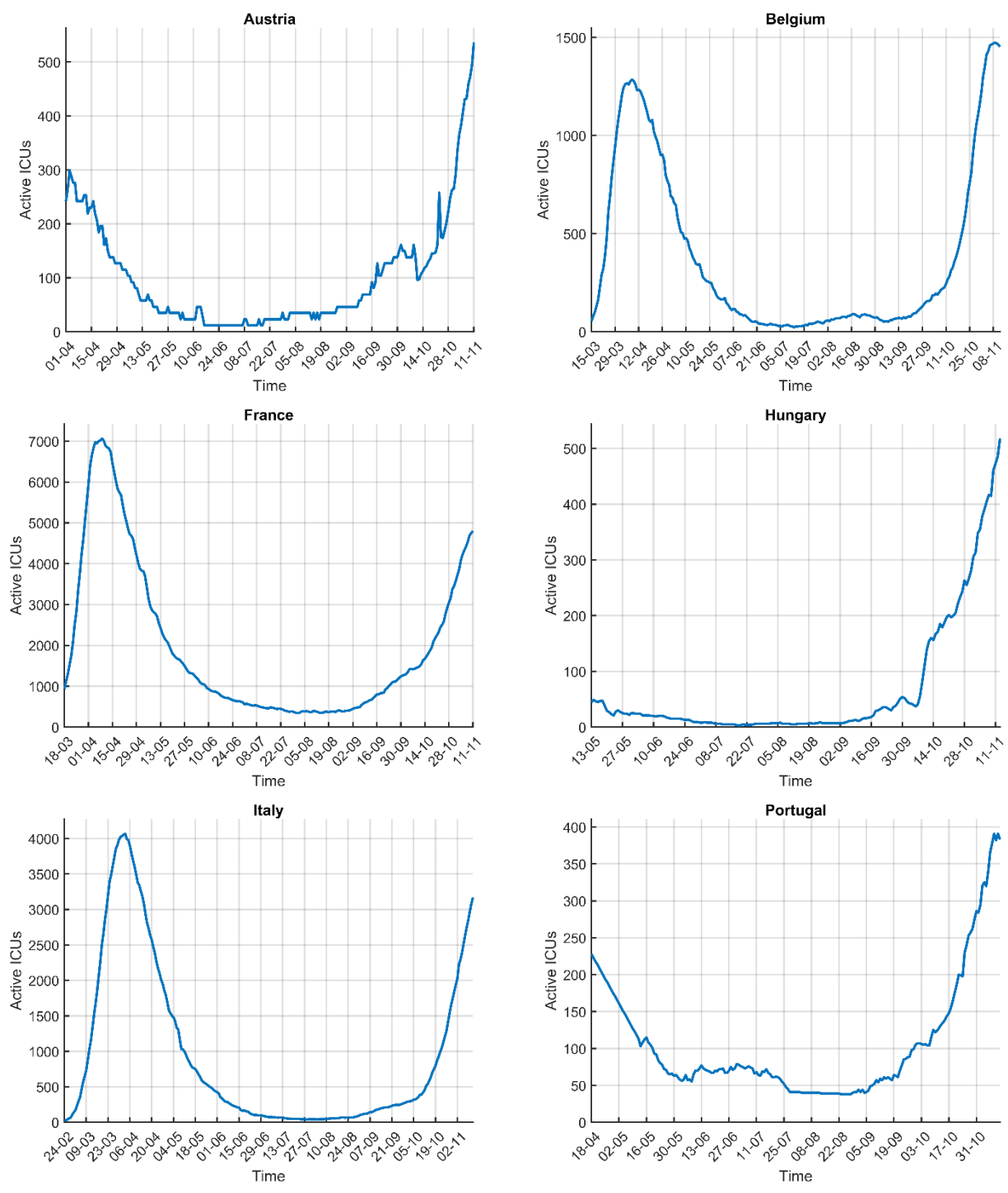
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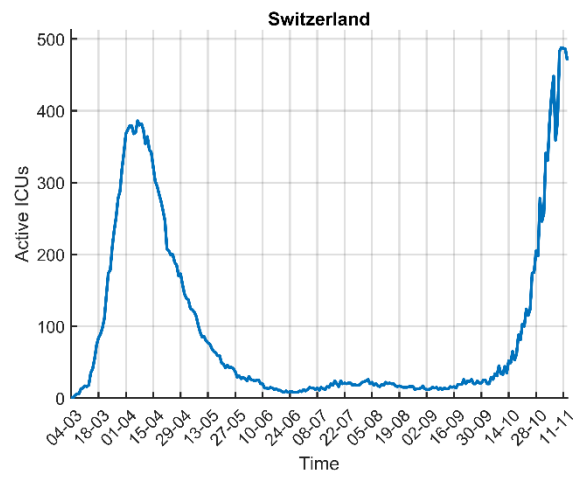
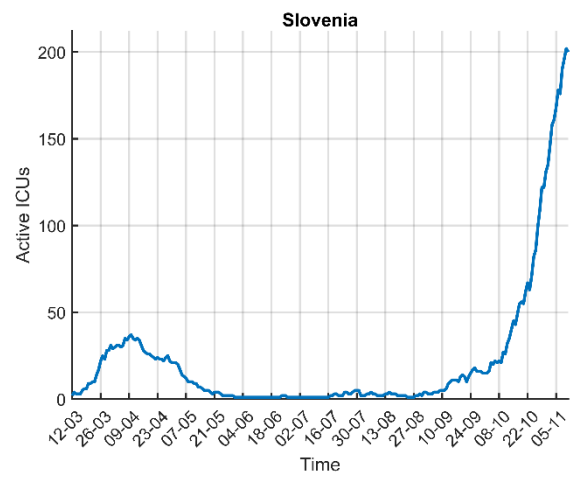
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¹ <https://github.com/ec-jrc/COVID-19>

² https://ec.europa.eu/eurostat/databrowser/view/hlth_rs_bds/default/table?lang=en

Evolution of of active ICUs in some EU countries.





Situation and trends in some European regions³

Table of current situation in Spain by region. Colour scale is indicated in each legend.

Country	Reported data						Indexes		
	14-day attack rate /10 ⁵ inh.	Active cases (last 14 days)	Attack rate /10 ⁵ inh.	Cumulative cases	Mortality /10 ⁵ inh.	Cumulative deaths	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
Melilla	1,038.8	880	4,067.8	3,446	30.7	26	0.69	720	9
Aragon	987.8	13,047	4,856.5	64,145	132.5	1,750	0.85	837	9
Ceuta	947.6	804	2,659.0	2,256	41.3	35	0.91	861	9
Navarra	943.9	6,135	5,544.1	36,035	114.2	742	0.81	764	9
Castilla y Leon	929.2	22,377	4,135.3	99,582	160.2	3,858	0.93	867	9
La Rioja	781.9	2,452	4,529.9	14,205	153.4	481	1.03	809	9
Murcia	769.0	11,440	3,026.9	45,031	16.5	245	1.01	776	9
Euskadi	767.9	16,726	3,608.1	78,587	100.6	2,191	1.07	823	9
Catalunya	741.8	56,119	3,487.3	263,817	96.4	7,293	0.89	663	9
Andalucia	599.9	50,551	2,007.6	169,165	32.2	2,710	0.90	539	9
Extremadura	599.9	6,391	2,219.4	23,645	71.9	766	0.95	572	9
Castilla-La Mancha	590.4	12,018	3,598.1	73,240	165.8	3,375	0.87	515	9
Asturias	510.6	5,220	1,524.4	15,584	51.7	529	1.16	590	9
Cantabria	470.4	2,736	2,028.8	11,801	43.8	255	1.19	558	9
Madrid	356.5	23,672	4,858.4	322,631	162.8	10,808	0.87	310	9
Galicia	333.5	9,005	1,474.9	39,826	35.7	963	0.89	297	9
Comunitat Valenciana	314.7	15,656	1,533.7	76,292	38.3	1,904	1.00	314	9
Baleares	248.5	2,952	1,727.3	20,517	31.6	375	1.21	300	9
Canarias	75.8	1,673	835.8	18,448	13.4	296	1.16	88	7

Colour scale							
>150.0	Worst	Worst	Worst	Worst	Worst	>2.0	>150
0.0	Best	Best	Best	Best	Best	0.0	0

Table of current situation in Sweden by region. Colour scale is indicated in each legend.

Country	Reported data				Indexes		
	14-day attack rate /10 ⁵ inh.	Active cases (last 14 days)	Attack rate /10 ⁵ inh.	Cumulative cases	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
Örebro	838.6	2,499	2,458.7	7,327	1.13	945	9
Jönköping	688.4	2,430	2,568.3	9,066	1.21	833	9
Stockholm	677.6	16,106	2,147.4	51,043	1.36	923	9
Gotland	608.5	359	1,316.9	777	1.85	1,124	9
Kronoberg	607.5	1,215	1,839.5	3,679	1.64	999	9
Uppsala	604.0	2,271	2,143.6	8,060	1.01	612	9
Västmanland	563.5	1,544	1,989.4	5,451	1.64	925	9
Skåne	488.8	6,658	1,221.7	16,639	1.45	711	9
Östergötland	478.6	2,211	1,698.5	7,847	0.97	466	9
Södermanland	473.0	1,211	1,672.7	4,282	1.25	592	9
Västra Götaland	457.9	7,830	1,913.8	32,726	1.43	656	9
Västerbotten	440.1	1,206	937.2	2,568	1.73	763	9
Dalarna	434.8	1,248	1,586.8	4,554	1.19	517	9
Halland	429.2	1,412	1,473.3	4,847	1.16	496	9
Norrbottn	385.6	964	1,275.2	3,188	1.53	591	9
Gävleborg	325.8	935	1,660.6	4,766	1.29	421	9
Västernorrland	320.8	786	1,193.9	2,925	2.39	767	9
Kalmar	296.3	720	784.8	1,907	1.42	422	9
Jämtland	263.8	343	1,533.1	1,993	2.48	656	9
Värmland	251.2	706	841.6	2,365	1.20	301	9
Blekinge	216.3	346	840.6	1,345	1.17	252	9

Colour scale					
>150.0	Worst	Worst	Worst	>2.0	>150
0.0	Best	Best	Best	0.0	0

³ <https://github.com/ec-jrc/COVID-19/tree/master/data-by-region>

Table of current situation in Belgium by region. Colour scale is indicated in each legend.

Country	Reported data						Indexes		
	14-day attack rate /10 ⁵ inh.	Active cases (last 14 days)	Attack rate /10 ⁵ inh.	Cumulative cases	Mortality /10 ⁵ inh.	Cumulative deaths	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
Wallonia	1,764.0	64,280	6,400.9	233,249	146.6	5,341	0.59	1,047	9
Brussels	1,086.6	13,126	5,899.8	71,270	174.0	2,102	0.62	670	9
Flanders	741.4	48,854	3,145.8	207,279	97.9	6,448	0.68	501	9

Colour scale								
>150.0	Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>150
0.0	Best	Best	Best	Best	Best	Best	0.0	0

Table of current situation in Italy by region. Colour scale is indicated in each legend.

Country	Reported data						Indexes		
	14-day attack rate /10 ⁵ inh.	Active cases (last 14 days)	Attack rate /10 ⁵ inh.	Cumulative cases	Mortality /10 ⁵ inh.	Cumulative deaths	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
Bolzano	1,564.1	8,149	3,067.9	15,984	71.8	374	1.10	1,719	9
Valle d'Aosta	1,366.7	1,722	3,855.6	4,858	185.7	234	1.11	1,511	9
Lombardia	1,170.5	117,766	3,027.4	304,591	189.1	19,028	1.07	1,252	9
Piemonte	1,137.8	49,563	2,693.1	117,312	114.0	4,964	1.16	1,318	9
Umbria	900.7	7,944	2,000.0	17,640	26.5	234	1.04	936	9
Liguria	897.7	13,924	2,673.4	41,464	132.7	2,058	1.01	903	9
Campania	896.1	51,994	1,793.6	104,065	16.7	967	0.99	885	9
Toscana	874.2	32,607	1,992.8	74,330	48.1	1,793	1.04	911	9
Veneto	820.4	40,250	1,926.3	94,506	56.3	2,764	1.17	958	9
Emilia-Romagna	656.4	29,271	1,862.9	83,068	111.3	4,965	1.17	766	9
Friuli Venezia Giulia	630.1	7,656	1,462.6	17,771	41.6	506	1.23	772	9
Trento	621.9	3,346	2,248.0	12,094	93.9	505	1.06	661	9
Lazio	587.4	34,532	1,338.1	78,665	27.0	1,586	1.06	622	9
Abruzzo	584.8	7,672	1,354.7	17,774	50.4	661	1.19	698	9
Marche	538.4	8,211	1,431.5	21,830	71.7	1,094	1.01	543	9
Basilicata	440.2	2,474	810.7	4,556	13.0	73	1.19	523	9
Molise	384.6	1,177	911.4	2,789	20.3	62	0.97	373	9
Sicilia	351.5	17,575	767.6	38,381	16.7	837	1.12	392	9
Puglia	345.8	13,932	789.1	31,792	23.8	957	1.19	412	9
Sardegna	323.8	5,311	879.1	14,417	19.1	313	1.20	390	9
Calabria	233.8	4,553	483.6	9,416	8.4	164	1.32	308	9

Colour scale								
>150.0	Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>150
0.0	Best	Best	Best	Best	Best	Best	0.0	0

Situation and trends in other countries

Country	Reported data						Indexes		
	14-day attack rate /10 ⁵ inh.	Active cases (last 14 days)	Attack rate /10 ⁵ inh.	Cumulative cases	Mortality /10 ⁵ inh.	Cumulative deaths	$\rho_7^{(1)}$	EPG ⁽²⁾	Biocom-Cov degree
United States of America	486.0	1,608,647	3,188.7	10,554,801	73.2	242,430	1.31	636	9
United Kingdom	478.5	324,855	1,900.5	1,290,195	75.0	50,928	1.02	489	9
Argentina	312.6	141,293	2,842.1	1,284,504	77.0	34,782	0.94	293	9
Ukraine	298.3	130,448	1,145.3	500,865	20.9	9,145	1.12	335	9
Colombia	237.6	120,890	2,307.3	1,174,012	65.8	33,491	0.89	211	9
Russia	189.7	276,875	1,273.6	1,858,568	21.9	32,032	1.08	205	9
Iran	154.4	129,644	865.1	726,585	47.8	40,121	1.16	179	8
Belarus	147.4	13,926	1,168.9	110,455	10.9	1,027	1.04	153	8
Canada	143.2	54,035	748.7	282,577	28.5	10,768	1.23	176	8
Iraq	109.5	44,051	1,272.4	511,806	28.7	11,532	1.00	110	7
Qatar	103.5	2,982	4,690.4	135,132	8.1	234	1.04	107	7
Chile	101.4	19,388	2,753.9	526,438	76.9	14,699	1.01	102	7
Peru	99.0	32,643	2,821.3	930,237	106.4	35,067	0.93	92	7
Israel	99.0	8,569	3,722.0	322,159	31.3	2,706	0.86	86	7
Brazil	96.8	205,668	2,681.6	5,700,044	76.6	162,829	1.31	127	7
Ecuador	63.5	11,211	1,006.1	177,513	73.4	12,946	1.02	65	6
Mexico	61.3	79,024	769.3	991,835	75.3	97,056	1.14	70	6
India	47.3	639,944	645.1	8,728,795	9.5	128,668	0.99	47	6
Turkey	40.4	34,062	480.1	404,894	13.3	11,233	1.09	44	6
Philippines	23.6	25,885	367.6	402,820	7.0	7,721	1.00	24	4
Indonesia	17.6	48,243	165.4	452,291	5.5	14,933	1.16	20	4
Saudi Arabia	16.3	5,678	1,011.6	352,160	16.1	5,605	0.98	16	3
Pakistan	9.1	20,110	159.5	352,296	3.2	7,092	1.30	12	3

Colour scale								
>150.0	Worst	Worst	Worst	Worst	Worst	Worst	>2.0	>150
0.0	Best	Best	Best	Best	Best	Best	0.0	0

⁽¹⁾ ρ_7 is the average of 7 consecutive ρ , but can still fluctuate. ⁽²⁾ EPG stands for Effective Growth Potential, which is the product of reported cumulative incidence of last 14 days per 10⁵ inhabitants by ρ_7 (empiric reproduction number).

Biocom-Cov degree is an epidemiological situation scale based on the level of last week's mean daily new cases (<https://upcommons.upc.edu/handle/2117/189661>, <https://upcommons.upc.edu/handle/2117/189808>).

Analysis: On the weekend effect on confirmed cases and the resulting oscillations in the empiric reproduction number (Part II).

In last report, we discussed the problematics of oscillating patterns in daily new cases associated to the days of the week, which is amplified on weekends. We started our argument on the basis of the 7-day moving average:

$$n_7(t) = \frac{\sum_{i=t-3}^{t+3} n(t_i)}{7}$$

Then, we assumed the daily weight as the ratio between new cases in a certain day, $n(t)$, and the corresponding 7-day moving average value, $n_7(t)$:

$$w(t) = \frac{n(t)}{n_7(t)}$$

Given this variable, we defined the **regular daily pattern of under/over reporting** by averaging the particular weight at each day of the week during 5 consecutive weeks. For instance, given a 5-week dataset, we could asses the Monday's particular weight as follows:

$$w_{Monday} = \frac{1}{5} \sum_{i=1:5} w(t_i) \quad ; \quad t_i = \text{Mondays}$$

We proposed the use of only last 5 weeks because the reporting pattern can change with time.

Despite in last report we used Spain as one of the examples, we cannot keep using it because the solution that we propose to overcome the weekend effect does not work when cases are lacking (Spain do not report on weekends). In a future report we will particularly focus on these cases. Today, we have replaced it by Slovenia. Figure 1 shows the daily patterns of under/over reporting for Slovenia, Germany, Italy and UE+EFTA+UK.

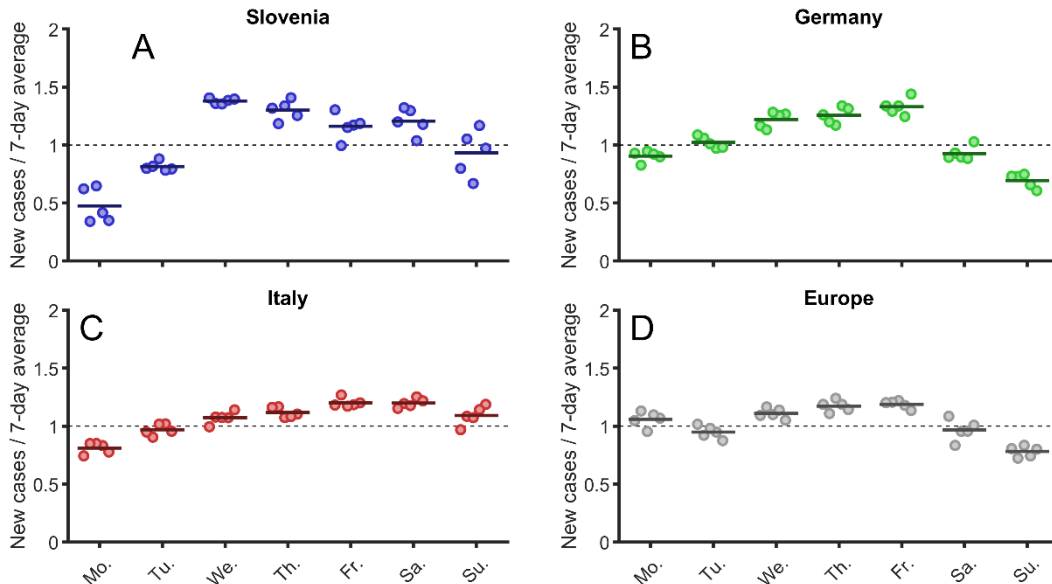


Figure 1. Reporting ratio between new cases in a certain day, $n(t)$, and the corresponding 7-day moving average value, $n_7(t)$, for each day of the week in Slovenia, Germany, Italy and EU+EFTA+UK. These ratios are evaluated for last 5 weeks

Re-normalization of new cases to eliminate the weekend effect

The assessed weights can be used for a re-normalization of new cases as follows:

$$\bar{n}(t) = \frac{n(t)}{w(\text{week day}(t))}$$

This expression uses the reporting pattern weights to correct the cases reported each day of the week. Those days of the weeks that normally under-report cases (e.g., weekends) are divided by a number that is lower to 1 and, therefore, their re-normalized value results on an increase. On the contrary, those days of the week that usually over-report cases are divided by a number that is greater to 1 and, therefore, their re-normalized value becomes lower.

Figure 2 shows re-normalized values for new cases datasets of Slovenia, Germany, Italy and UE+EFTA+UK.

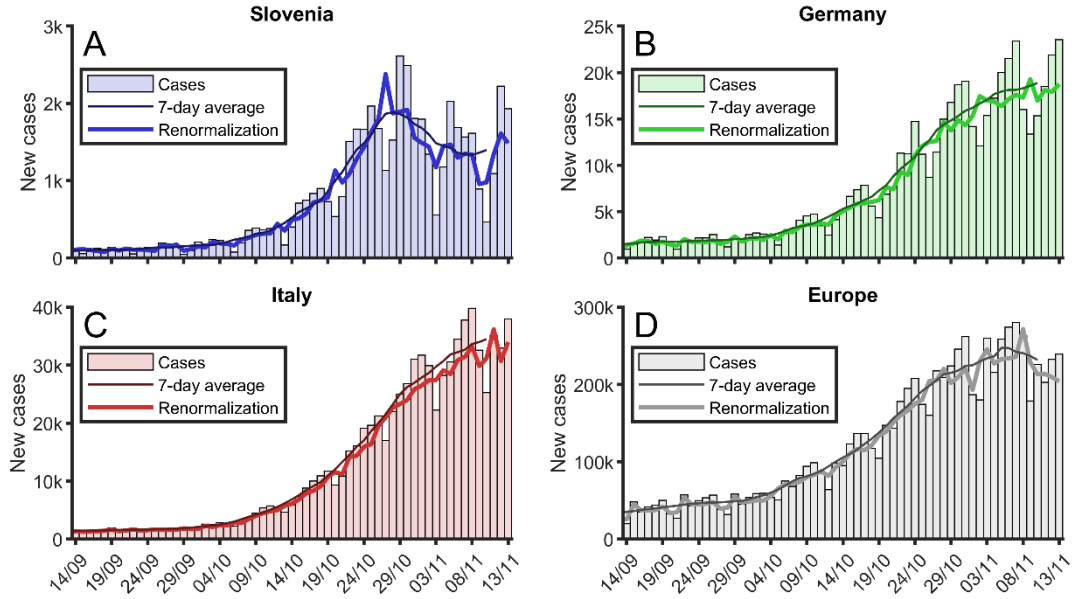


Figure 2. Renormalization of daily new cases (thick coloured lines) by using reporting pattern weights. Coloured bars show daily new cases without the correction, and the thin lines show the 7-day moving average of new cases.

Assessing the empiric reproduction number with re-normalized data series

Re-normalized daily new cases ($\bar{n}(t)$) smooth daily oscillations, in particular those associated with weekends. Then, we can use this data series to calculate the empiric reproduction number as follows:

$$\bar{n}_7(t) = \frac{\sum_{i=t-3}^{t+3} \bar{n}(t_i)}{7}$$

$$\rho_{7,new}(t) = \frac{\bar{n}_7(t-1) + \bar{n}_7(t) + \bar{n}_7(t+1)}{\bar{n}_7(t-6) + \bar{n}_7(t-5) + \bar{n}_7(t-4)}$$

Figure 3 shows the comparison between old empiric reproduction number ($\rho_{7,old}$, calculated from the original data series) and new reproduction number ($\rho_{7,new}$, calculated from the re-normalized cases series) for Slovenia, Germany, Italy and UE+EFTA+UK..

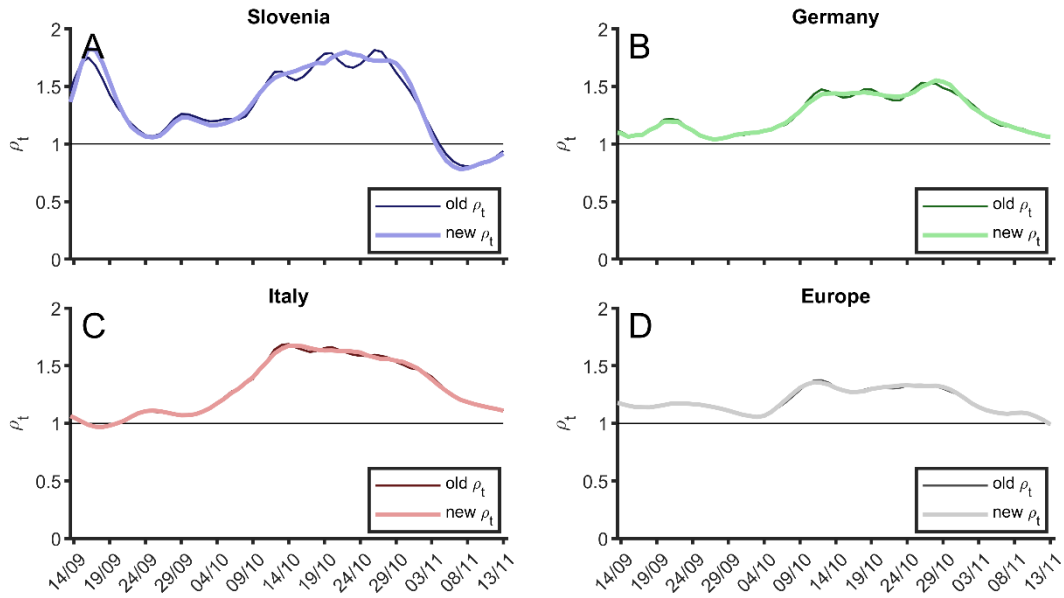


Figure 3. Old (thin lines) and new (thick lines) empiric reproduction numbers, calculated from the original cases and the re-normalized cases, respectively.

Figure 3 shows some interesting dynamics:

- Whenever the ρ_7 increases or decreases, both $\rho_{7,old}$ and $\rho_{7,new}$ are overlapped.
- Whenever ρ_7 remains constant, $\rho_{7,old}$ presents fluctuations associated to the weekend effect rather than to a real acceleration or deacceleration of the pandemic. On the contrary, $\rho_{7,new}$ does not show such fluctuations, thus better reproducing the real dynamics of acceleration or deacceleration.
- Fluctuations in $\rho_{7,old}$ are wider when it is further from 1.

Let us zoom in figure 3 so that the differences between ρ_{old} and ρ_{new} are better appreciated.

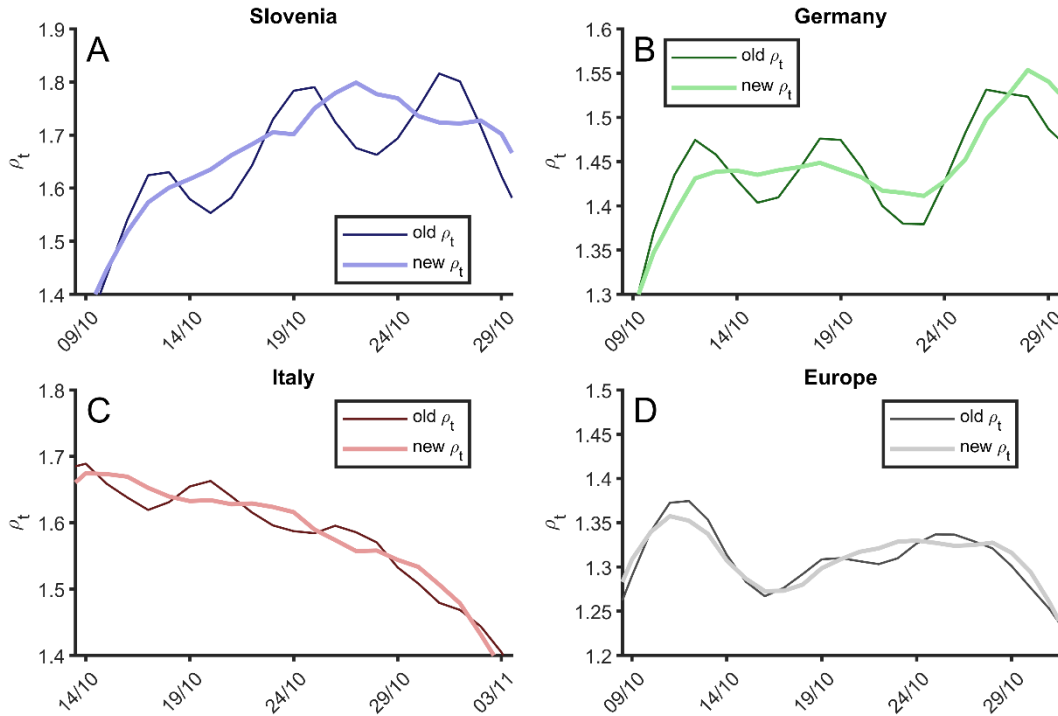


Figure 4. Old (thin lines) and new (thick lines) empiric reproduction numbers (zoom).

The zoom in figure 4 shows that fluctuations in $\rho_{7,old}$ can reach a value of 0.1, thus invalidating the first decimal of the empiric reproduction number. Therefore, this must be taken into account when interpreting the dynamics of $\rho_{7,old}$.

Stochastic simulation to assess the errors in $\rho_{7,old}$ and $\rho_{7,new}$

We have designed a set of simulations, following the same strategy that was described in the last report. We have simulated a 21-day evolution in new cases, assuming a constant average $\bar{\rho}_7$ and the daily patterns of under/over reporting for Slovenia, Germany, Italy and UE+EFTA+UK when determining daily new cases. We have used a certain level of noise given by a Poisson distribution affecting daily new cases. Then, we have calculated ρ_{old} and ρ_{new} for a 21-day period, and we have simulated 100 runs of each scenario. We have explored a certain range of $\bar{\rho}_7$, from 0.4 to 1.6. For each $\bar{\rho}_7$, we have averaged the differences between the average ($\bar{\rho}_7$) and the two variables (ρ_{old} and ρ_{new}) for 21 days and 100 runs (i.e., 2,100 values).

Figures 5 and 6 show the box-plots of these errors for the studied countries. In particular, figure 5 assesses the error in ρ_{old} in each scenario while figure 6 shows the box plots for ρ_{new} .

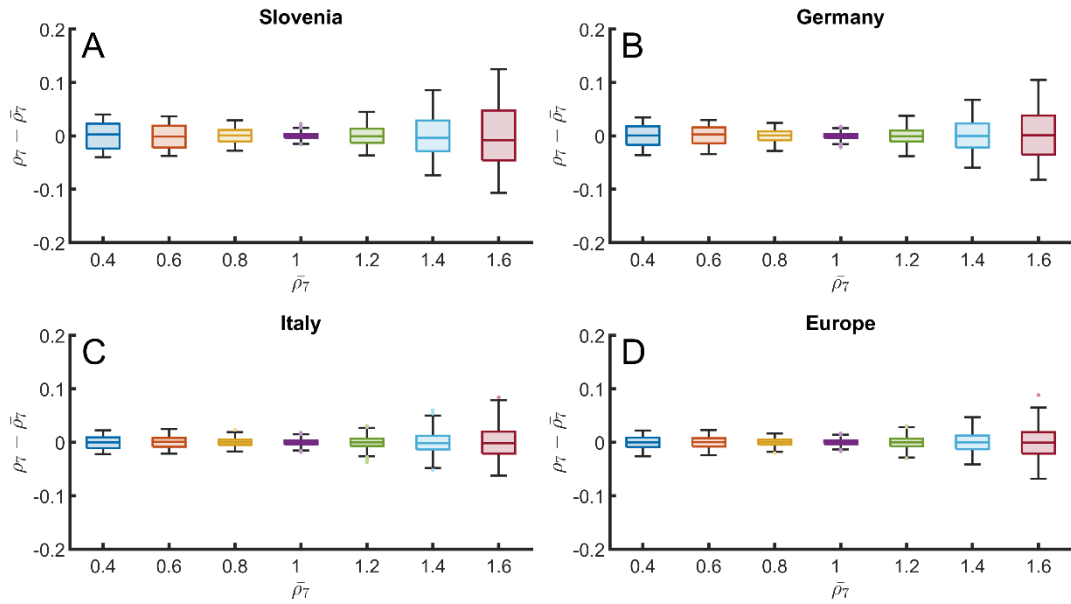


Figure 5. Difference between $\rho_{old,7}$ and $\bar{\rho}_7$ for different scenarios (x-axis).

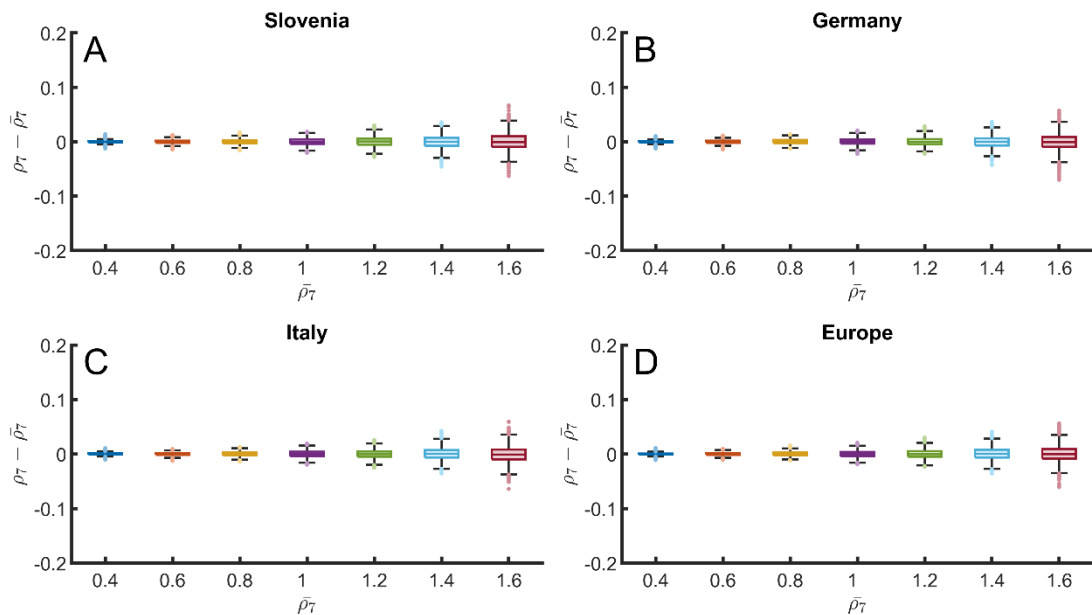


Figure 6. Difference between $\rho_{new,7}$ and $\bar{\rho}_7$ for different scenarios (x-axis).

These figures clearly show that the deviations are much lower when we use the new methodology for assessing the empiric reproduction number. In fact, the deviations in figure 6 ($\rho_{new,7}$) are mainly given by the stochasticity used in simulations, while the deviations in figure 5 ($\rho_{old,7}$) are clearly attributable to the weekend effect.

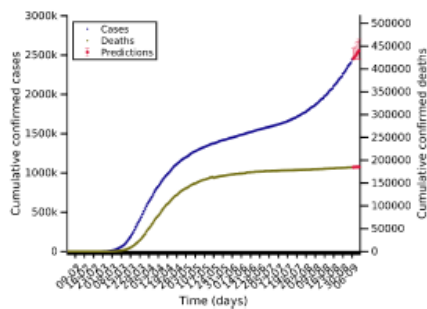
Conclusions

As we argued in last reports, most countries base their decisions on a few indicators, including the daily number of new cases and the reproduction number. As we have shown, under some conditions the empiric reproduction number increases or decreases due to the weekend effect rather than to a real acceleration or deacceleration of the epidemic. Therefore, it is essential to incorporate corrections as the one suggested here.

In future reports we will show a proposal to incorporate daily reporting patterns in the predictions, in order that they can consider the weekend effect.

EU+EFTA+UK 06-09-2020. Pop: 2632.4M. Cumulative incidence: 93/10⁵

Reported cumulative cases (blue) and deaths (brown), together with predictions (red)

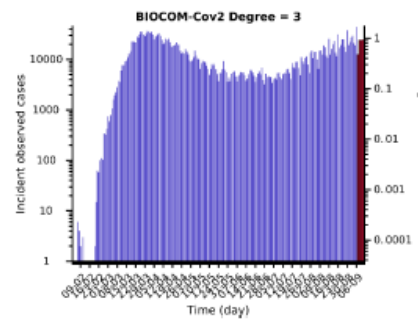
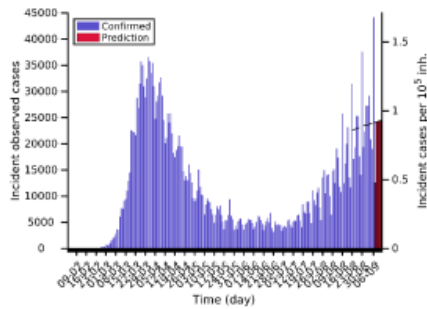


Predictions for next days		
Day	Number of cases	95% confidence interval
07-09-2020	2458068 (+125771)	(2445483 - 2586148)
09-09-2020	2568327 (+24279)	(2445483 - 2638990)
11-09-2020	2553261 (+24051)	(2445483 - 2760209)

Current indicators		
R_{eff}	IRIS	CFR
13	14	1.17 %

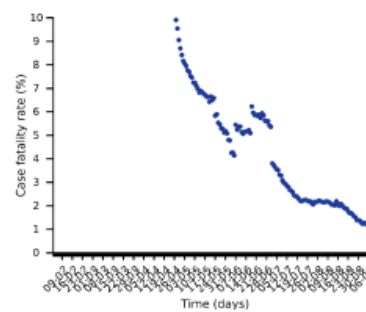
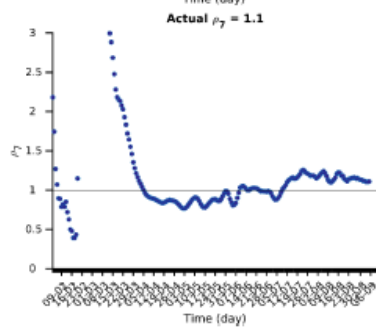
Predictions and indicators

Incident observed cases and predictions.



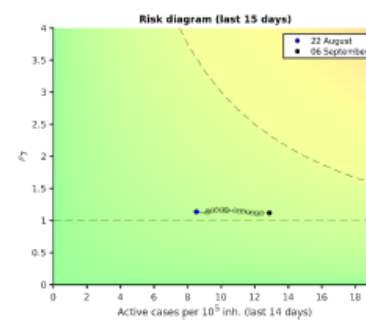
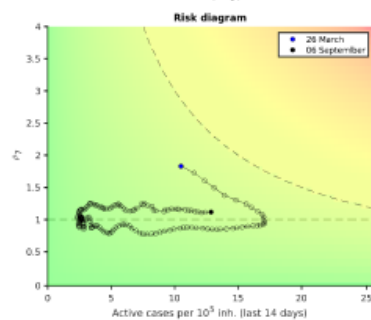
Incident observed cases in a logarithmic scale, with Biocom-Cov degree.

Evolution of empiric reproduction number ρ_T



Case fatality rate

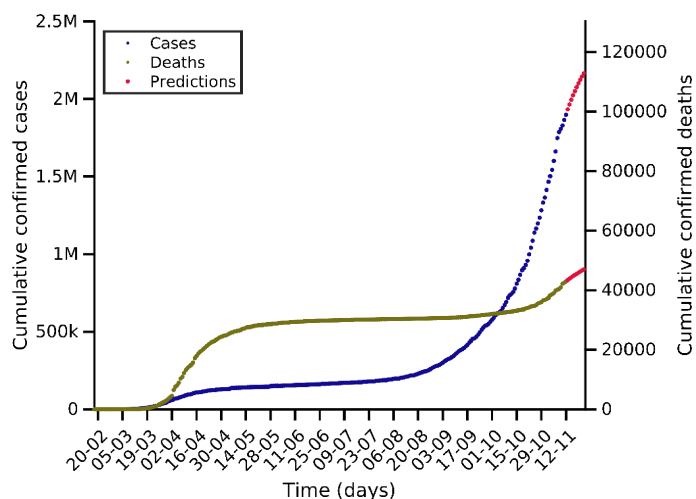
Risk diagram



Risk diagram of last 15 days

**(1) Analysis and prediction of COVID-19
for EU+EFTA+UK**

France 12-11-2020. Pop: 65.3M. Cumulative incidence: 2909/10⁵

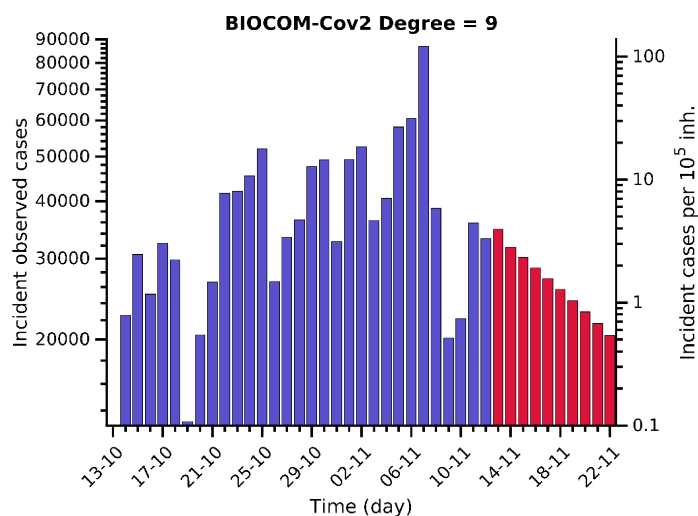
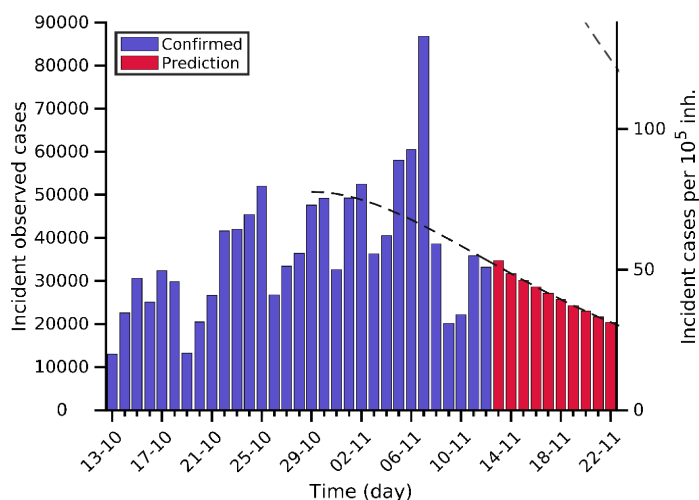


Predictions for next days

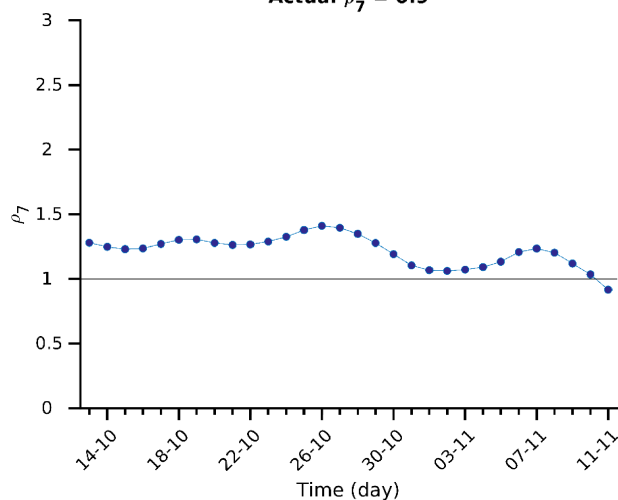
Day	Number of cases	95% Confidence Interval
15-11-2020	1995369 (+96659)	[1915272 - 2075465]
19-11-2020	2101211 (+202501)	[1979504 - 2222917]
22-11-2020	2166253 (+267543)	[1989199 - 2343308]

Current indicators

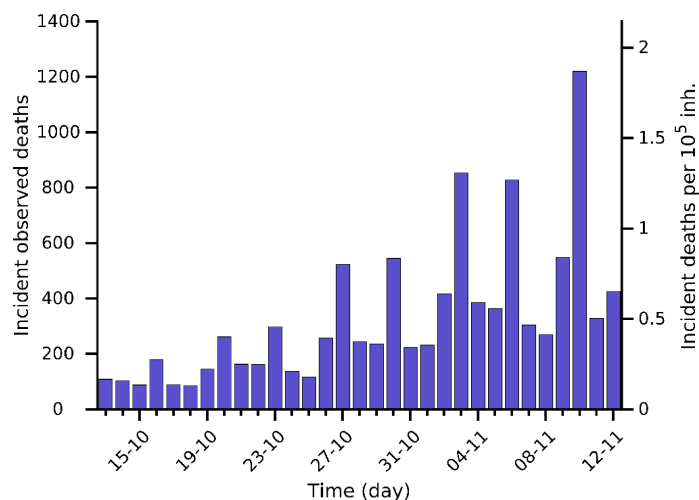
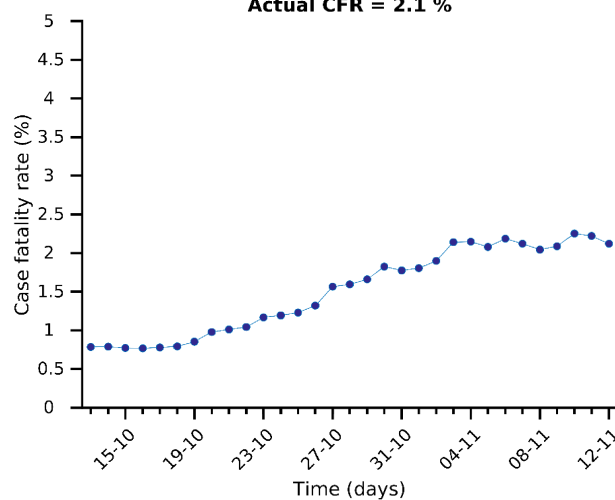
	A14	EPG	CFR	N7	D7
Today	944	865	2.12 %	42478	560
A Week ago	923	1007	2.08 %	45514	431
Maximum	1015	1227	4.94 %	54869	1101



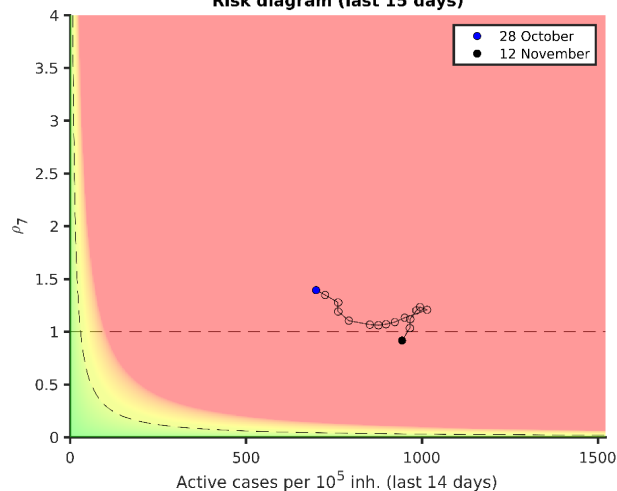
Actual $\rho_7 = 0.9$



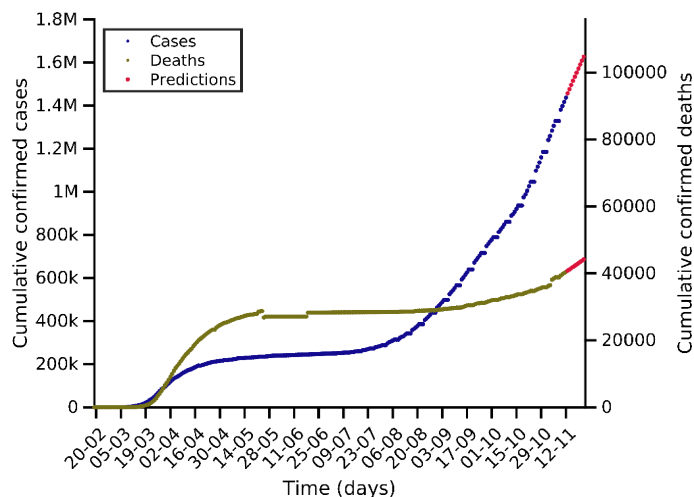
Actual CFR = 2.1 %



Risk diagram (last 15 days)



Spain 12-11-2020. Pop: 47.0M. Cumulative incidence: 3056/10⁵

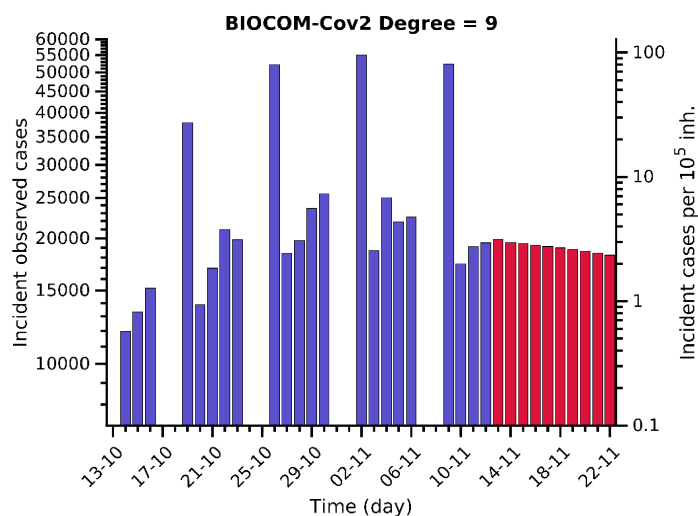
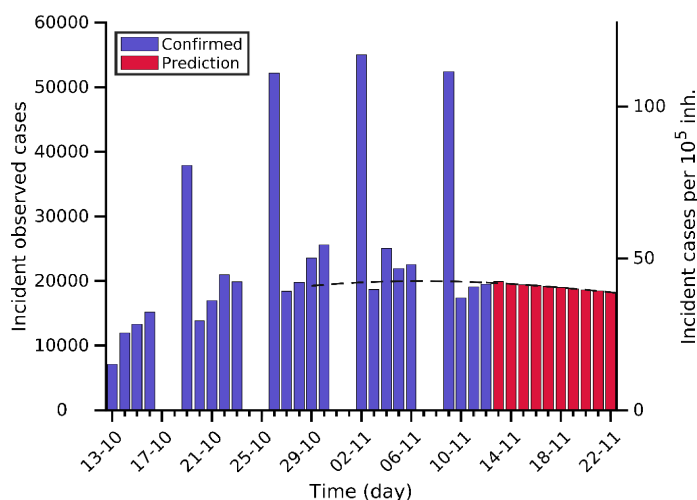


Predictions for next days

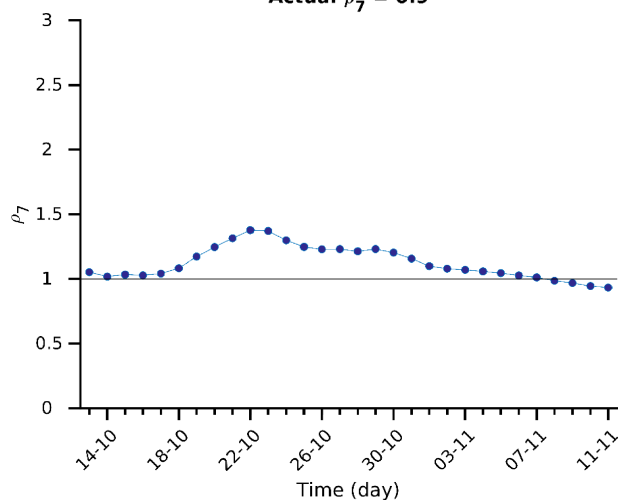
Day	Number of cases	95% Confidence Interval
15-11-2020	1496091 (+58871)	[1444616 - 1547567]
19-11-2020	1572303 (+135083)	[1467945 - 1676660]
22-11-2020	1627627 (+190407)	[1441492 - 1813762]

Current indicators

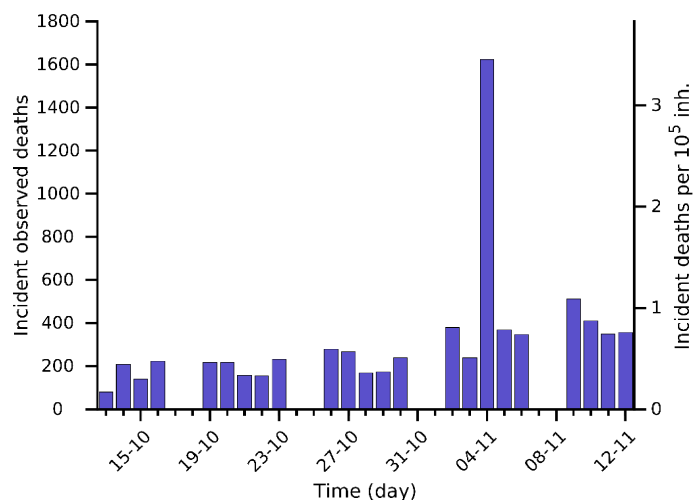
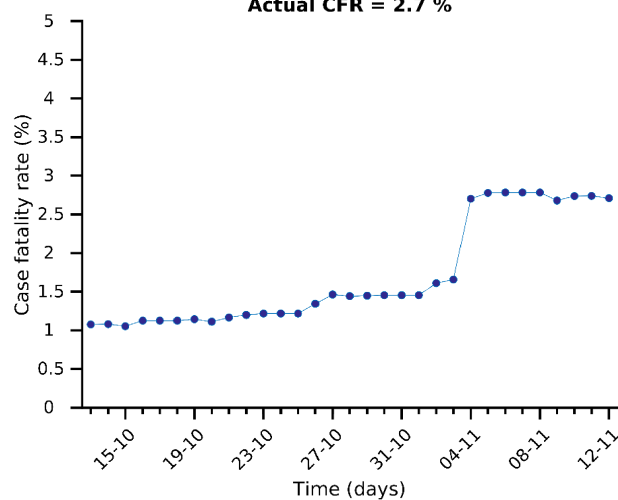
	A14	EPG	CFR	N7	D7
Today	589	550	2.71 %	18701	282
A Week ago	595	630	2.78 %	20890	407
Maximum	602	652	2.78 %	21129	868



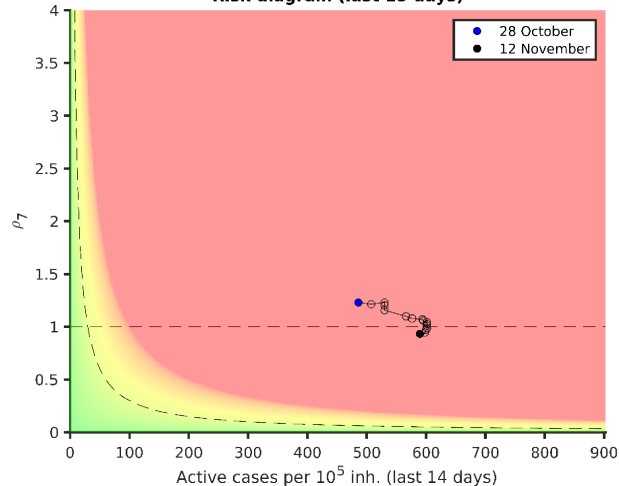
Actual $\rho_7 = 0.9$



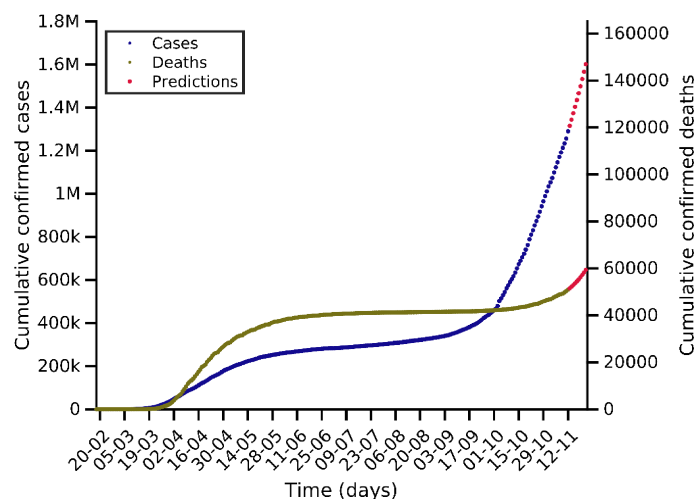
Actual CFR = 2.7 %



Risk diagram (last 15 days)



UK 12-11-2020. Pop: 67.9M. Cumulative incidence: 1901/10⁵

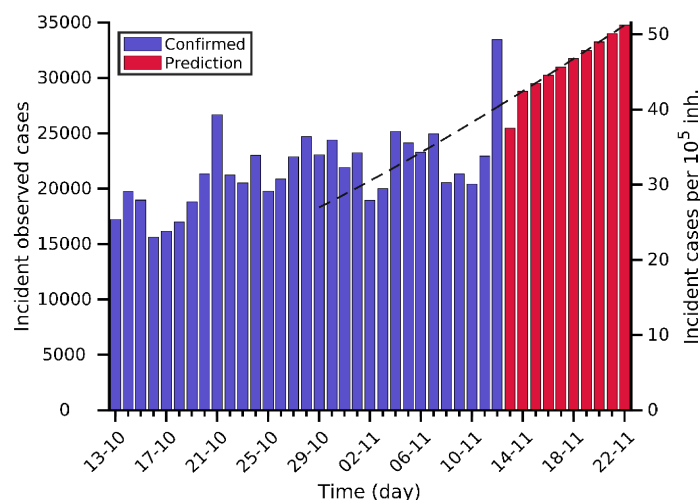


Predictions for next days

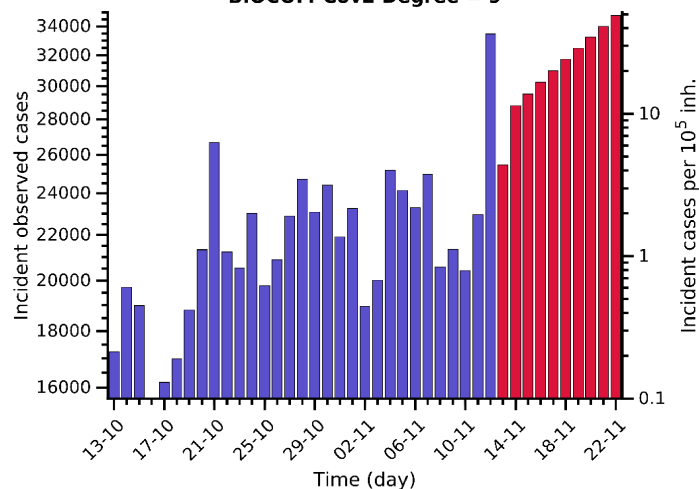
Day	Number of cases	95% Confidence Interval
15-11-2020	1373987 (+83792)	[1314626 - 1433348]
19-11-2020	1499468 (+209273)	[1345816 - 1653120]
22-11-2020	1601478 (+311283)	[1290195 - 1915144]

Current indicators

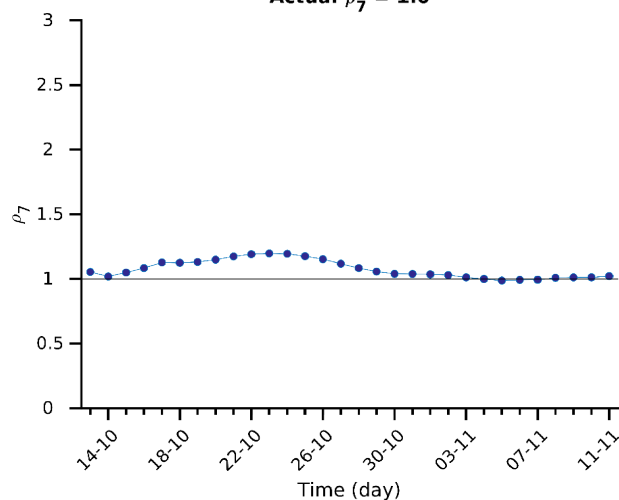
	A14	EPG	CFR	N7	D7
Today	479	489	2.00 %	23857	401
A Week ago	461	460	1.77 %	22551	309
Maximum	479	489	4.95 %	23857	942



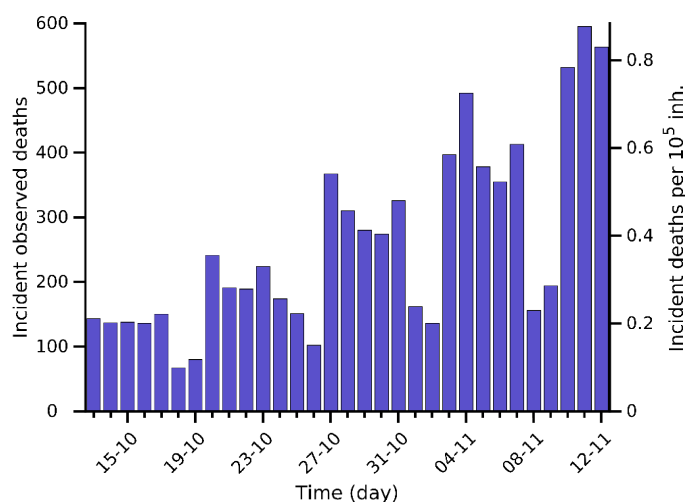
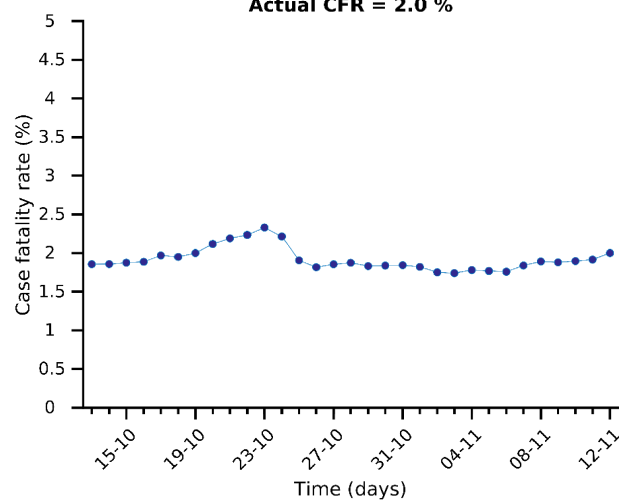
BIOCOM-Cov2 Degree = 9



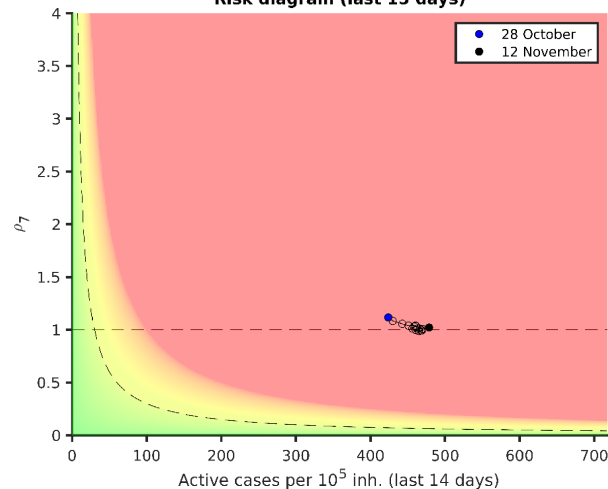
Actual $\rho_7 = 1.0$



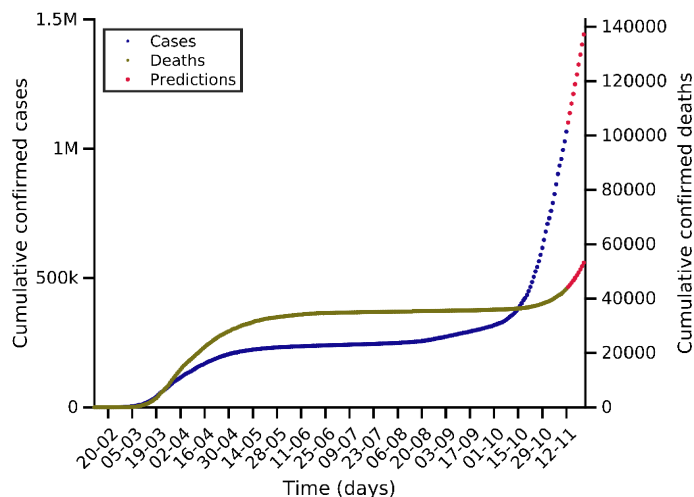
Actual CFR = 2.0 %



Risk diagram (last 15 days)



Italy 12-11-2020. Pop: 60.5M. Cumulative incidence: 1764/10⁵

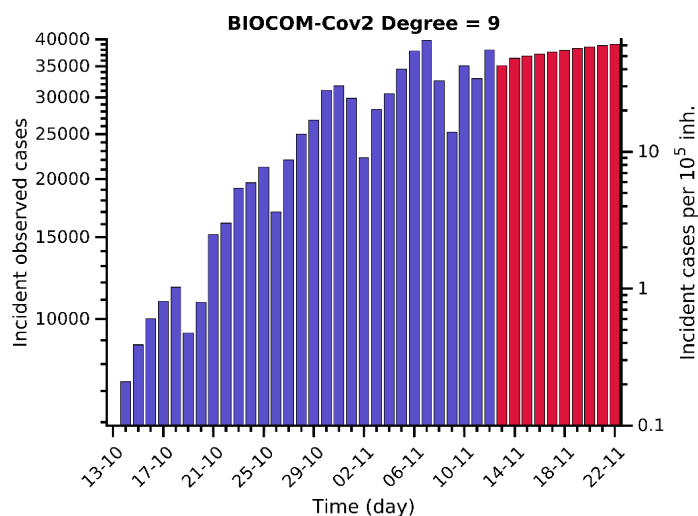
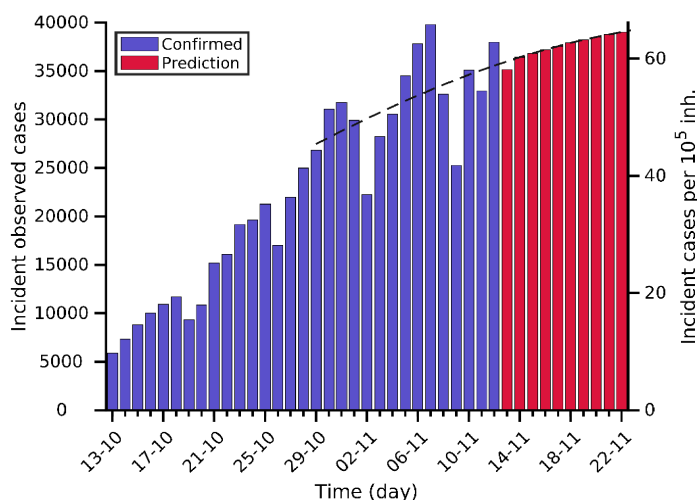


Predictions for next days

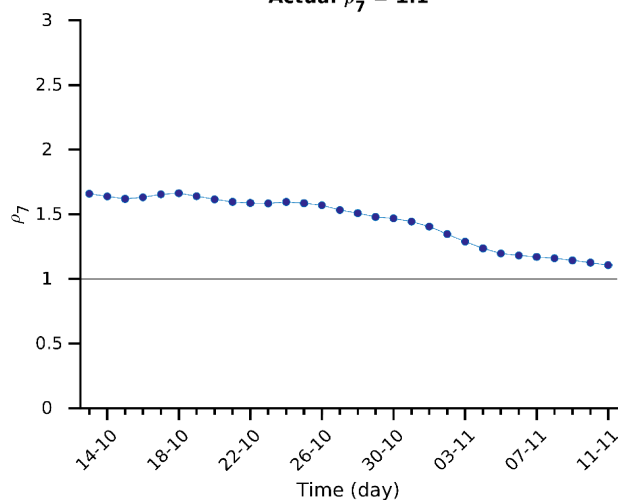
Day	Number of cases	95% Confidence Interval
15-11-2020	1174793 (+108392)	[1147731 - 1201854]
19-11-2020	1325676 (+259275)	[1263515 - 1387837]
22-11-2020	1441992 (+375591)	[1323056 - 1560929]

Current indicators

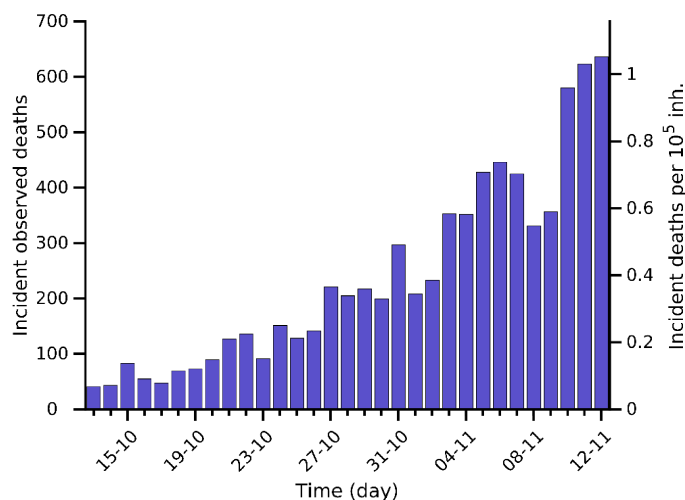
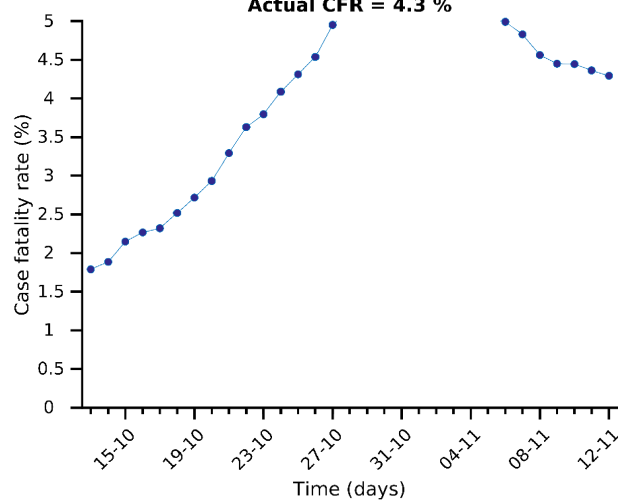
	A14	EPG	CFR	N7	D7
Today	744	823	4.29 %	34503	485
A Week ago	594	734	5.02 %	29755	296
Maximum	744	823	4.99 %	34503	822



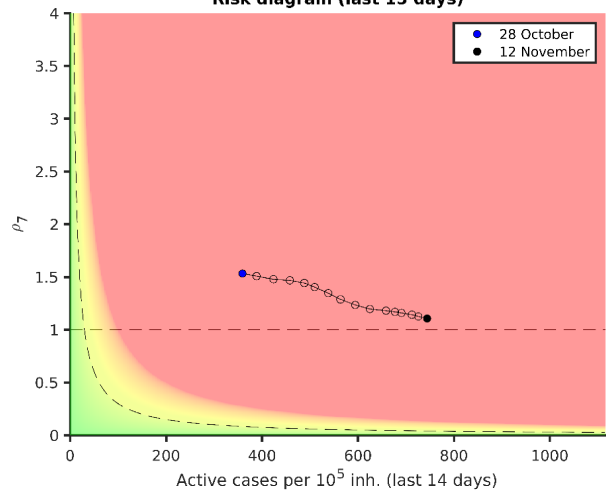
Actual $\rho_7 = 1.1$



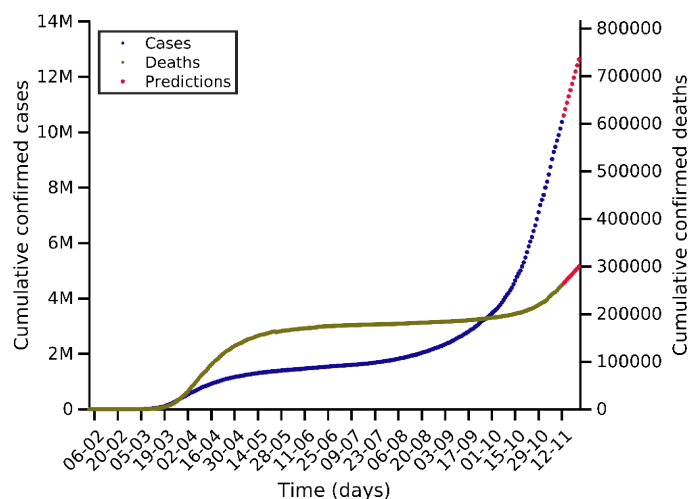
Actual CFR = 4.3 %



Risk diagram (last 15 days)



EU+EFTA+UK 12-11-2020. Pop: 527.9M. Cumulative incidence: 1965/10⁵

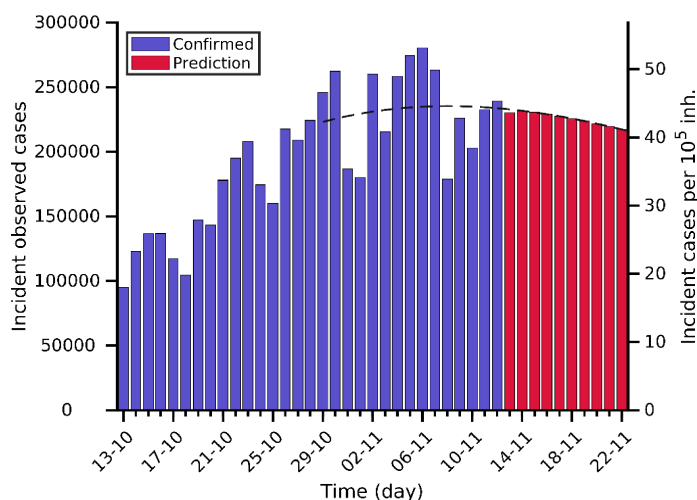


Predictions for next days

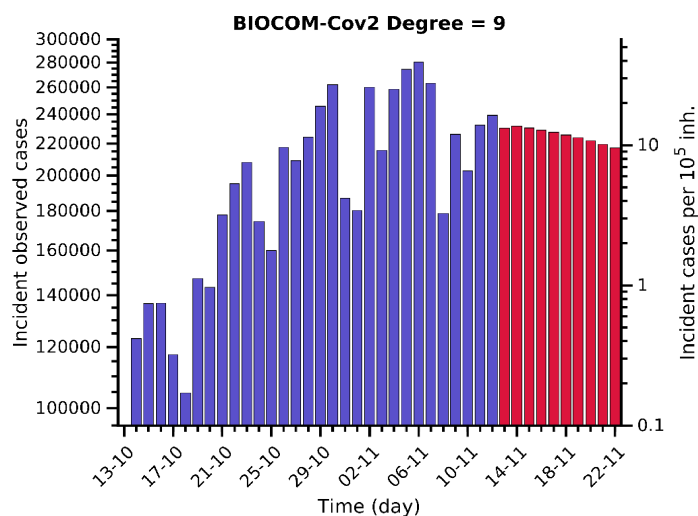
Day	Number of cases	95% Confidence Interval
15-11-2020	11066221 (+692640)	[10901937 - 11230504]
19-11-2020	11972171 (+1598590)	[11638214 - 12306128]
22-11-2020	12630800 (+2257219)	[12034627 - 13226972]

Current indicators

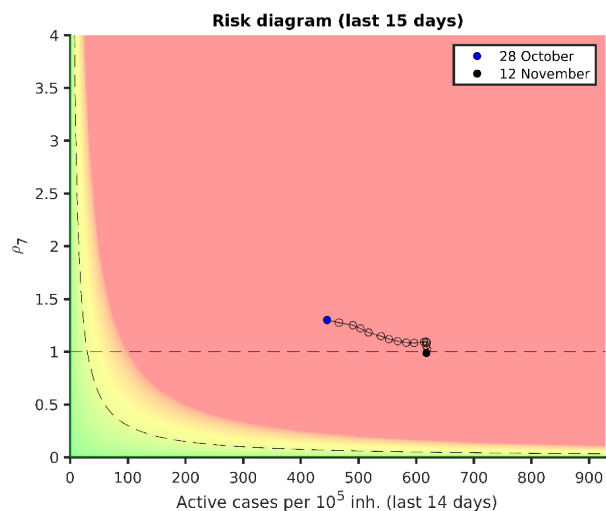
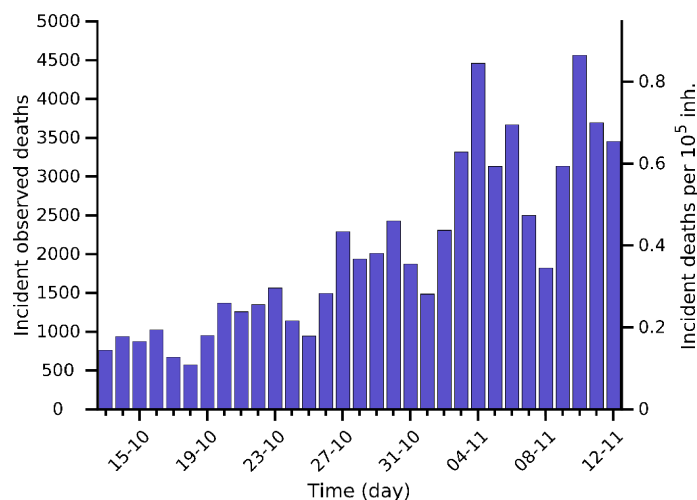
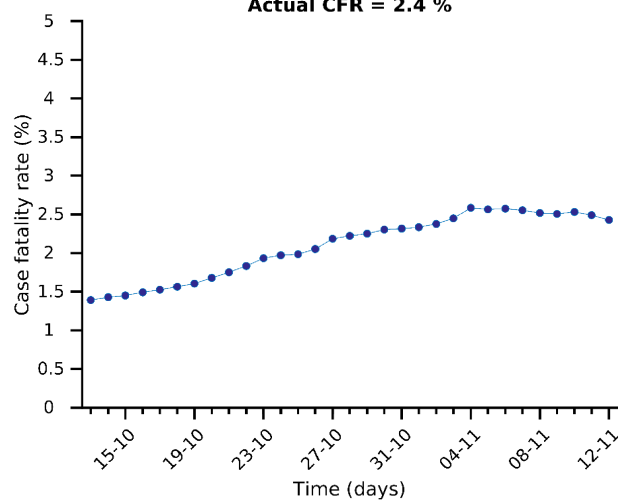
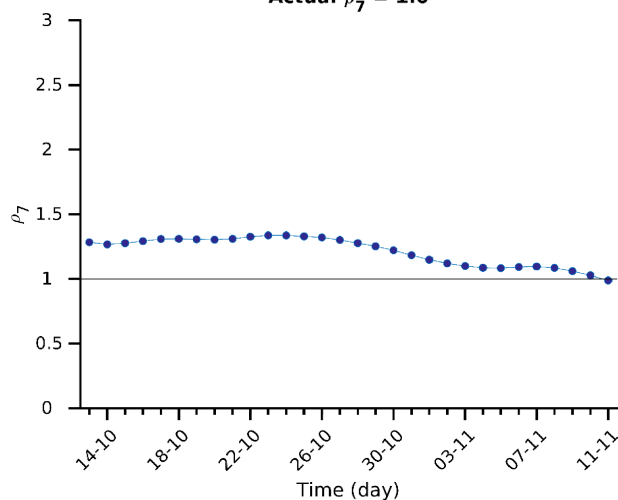
	A14	EPG	CFR	N7	D7
Today	618	610	2.43 %	231864	3261
A Week ago	583	633	2.57 %	233963	2714
Maximum	619	676	5.00 %	247464	4272



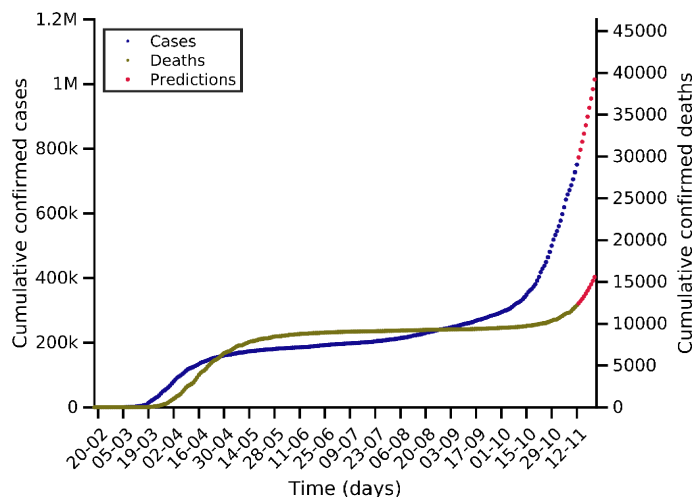
Actual $\rho_7 = 1.0$



Actual CFR = 2.4 %



Germany 12-11-2020. Pop: 83.8M. Cumulative incidence: 896/10⁵

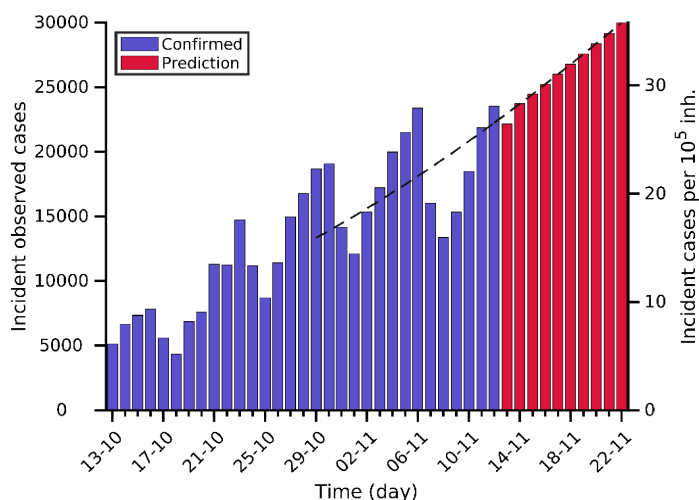


Predictions for next days

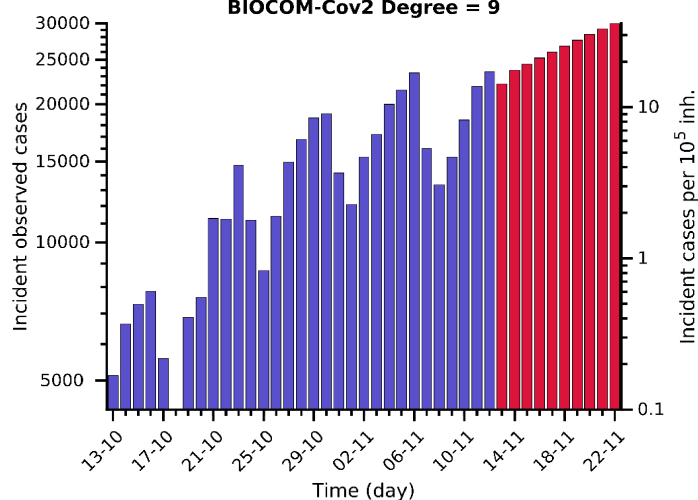
Day	Number of cases	95% Confidence Interval
15-11-2020	821424 (+70329)	[791057 - 851791]
19-11-2020	926990 (+175895)	[845154 - 1008825]
22-11-2020	1014525 (+263430)	[844438 - 1184612]

Current indicators

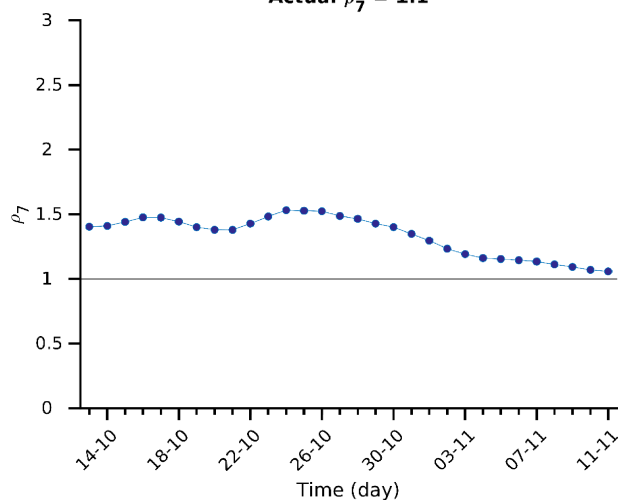
	A14	EPG	CFR	N7	D7
Today	300	317	2.09 %	18858	158
A Week ago	258	299	2.11 %	17056	107
Maximum	300	317	4.57 %	18858	233



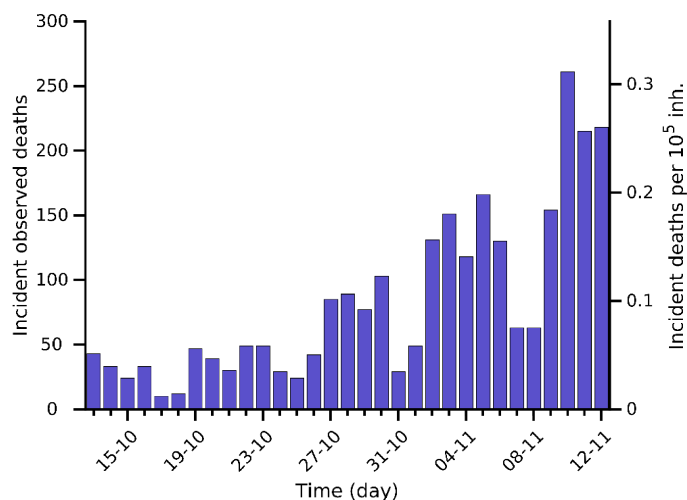
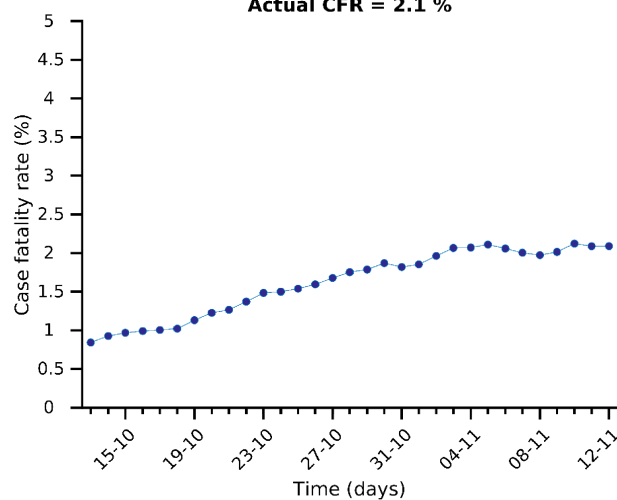
BIOCOM-Cov2 Degree = 9



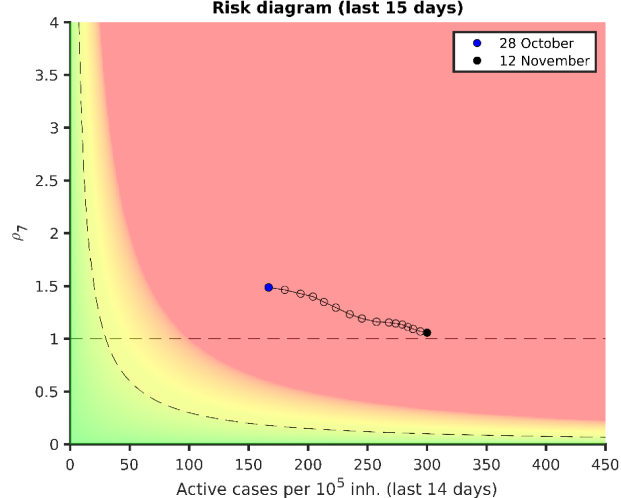
Actual $\rho_7 = 1.1$



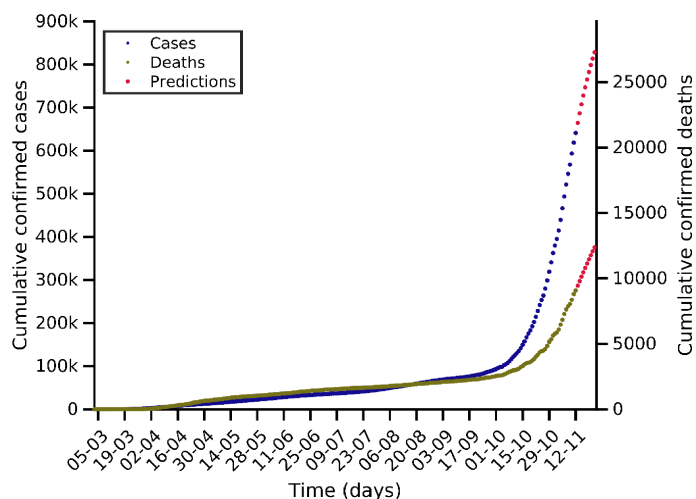
Actual CFR = 2.1 %



Risk diagram (last 15 days)



Poland 12-11-2020. Pop: 37.8M. Cumulative incidence: 1695/10⁵

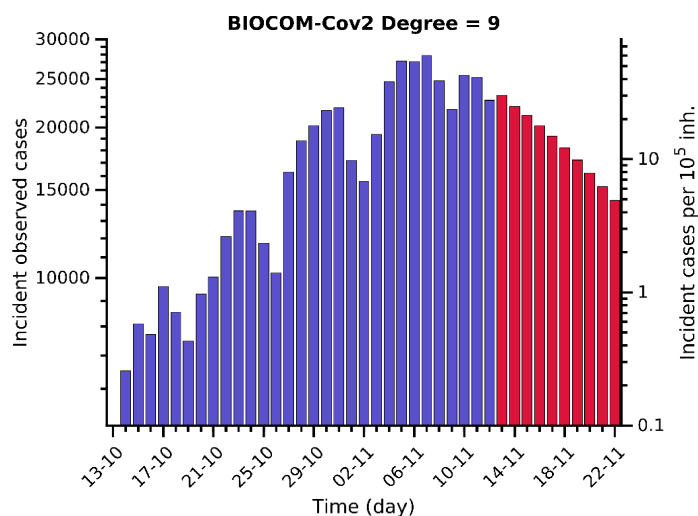
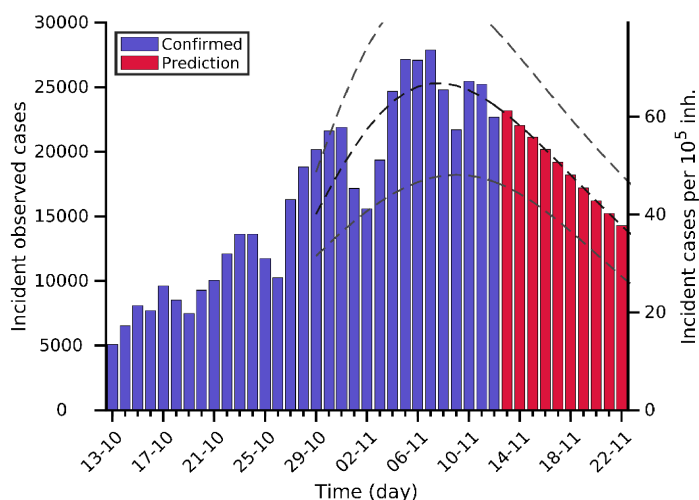


Predictions for next days

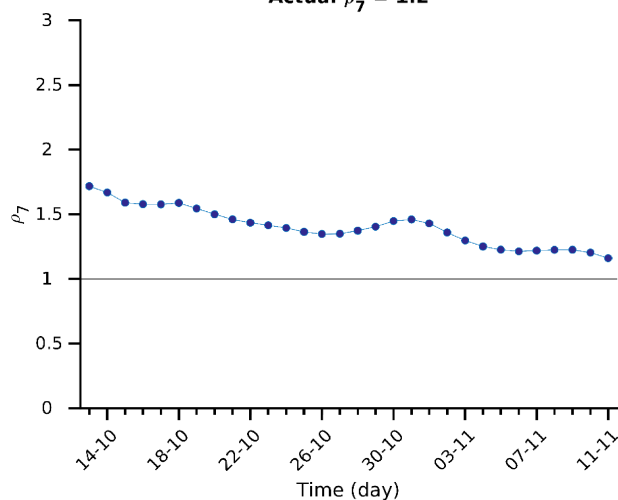
Day	Number of cases	95% Confidence Interval
15-11-2020	707837 (+66341)	[692986 - 722688]
19-11-2020	782628 (+141132)	[758954 - 806302]
22-11-2020	828360 (+186864)	[793434 - 863286]

Current indicators

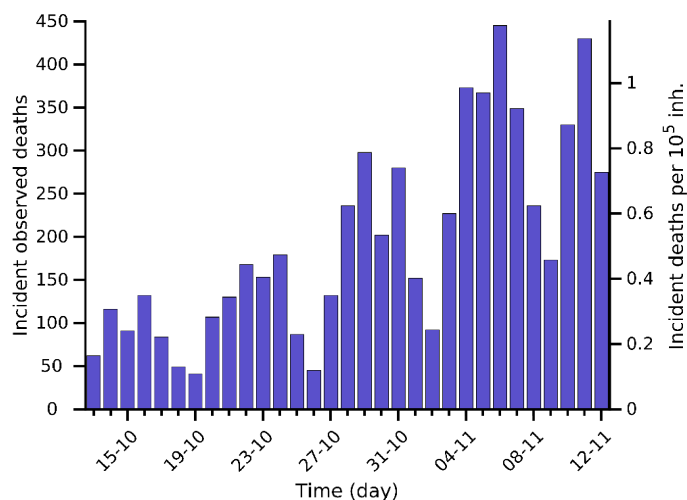
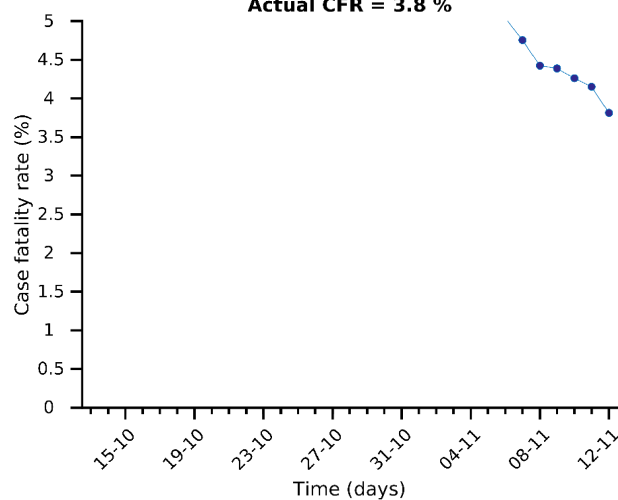
	A14	EPG	CFR	N7	D7
Today	852	988	3.81 %	24974	320
A Week ago	666	833	5.00 %	21068	242
Maximum	852	1017	5.00 %	25611	333



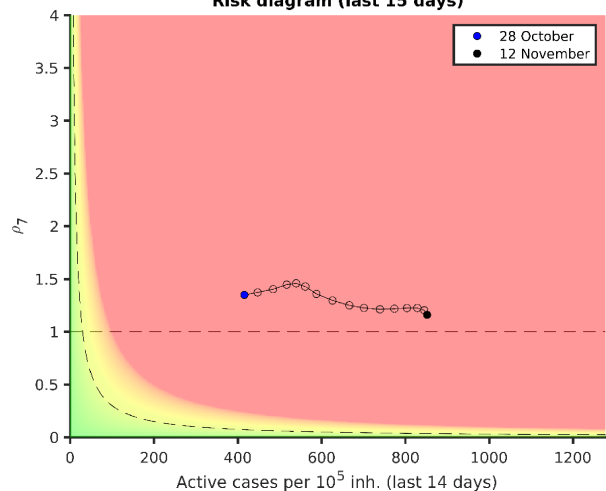
Actual $\rho_7 = 1.2$



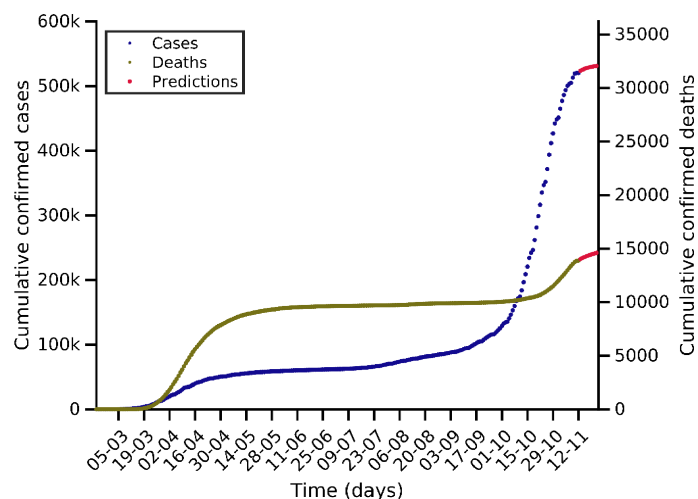
Actual CFR = 3.8 %



Risk diagram (last 15 days)



Belgium 12-11-2020. Pop: 11.6M. Cumulative incidence: 4489/10⁵

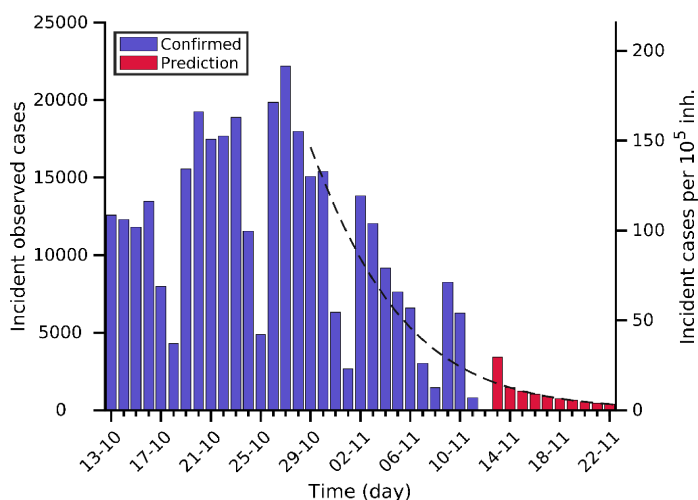


Predictions for next days

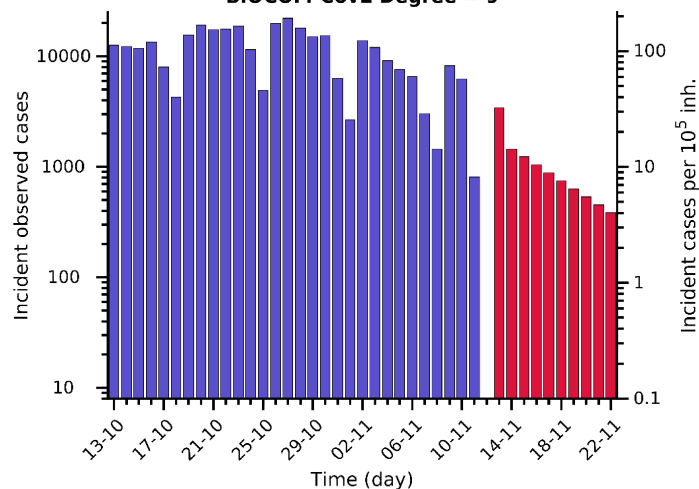
Day	Number of cases	95% Confidence Interval
15-11-2020	526410 (+6113)	[520297 - 558050]
19-11-2020	529720 (+9423)	[520297 - 564318]
22-11-2020	531094 (+10797)	[520297 - 568172]

Current indicators

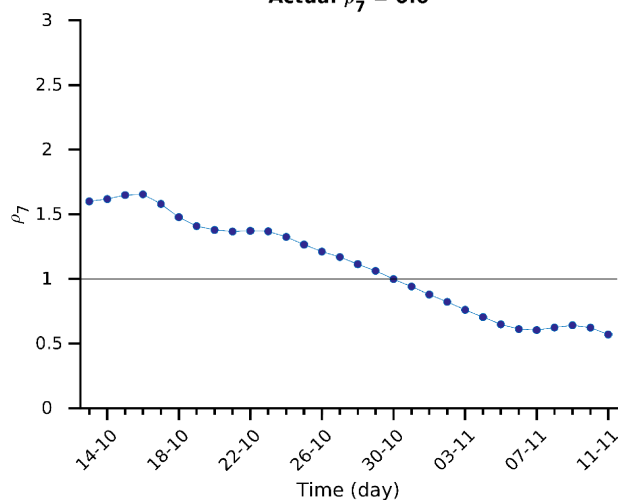
	A14	EPG	CFR	N7	D7
Today	806	459	1.53 %	3769	159
A Week ago	1531	1079	2.29 %	9575	184
Maximum	1795	2066	4.78 %	16148	285



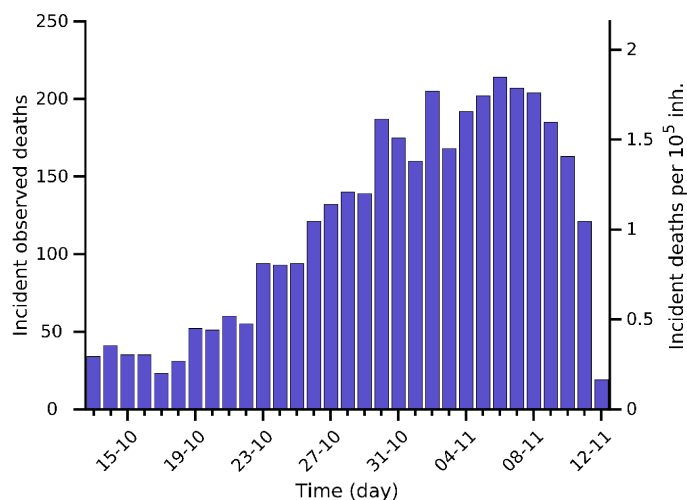
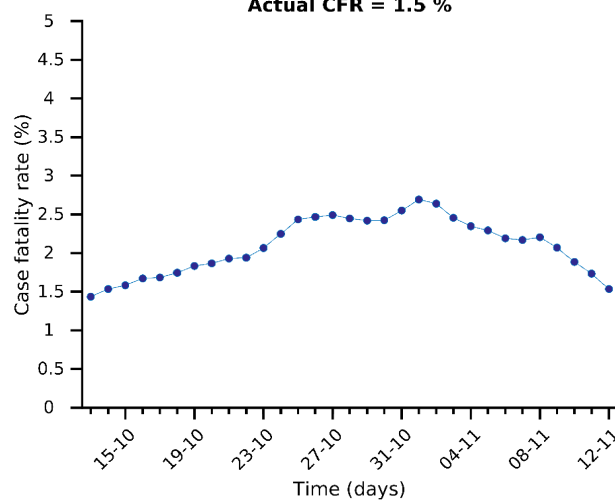
BIOCOM-Cov2 Degree = 9



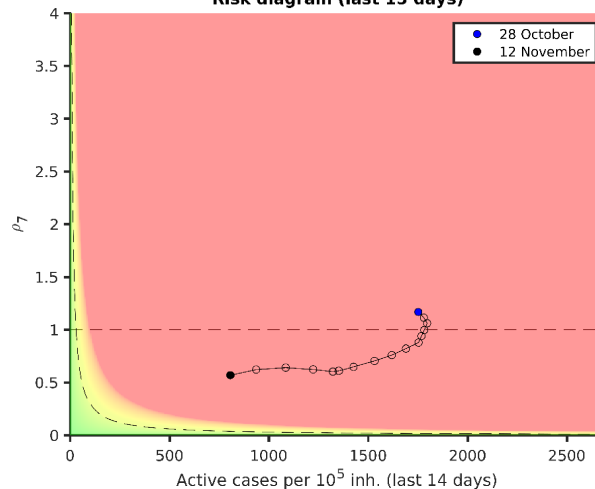
Actual $\rho_7 = 0.6$



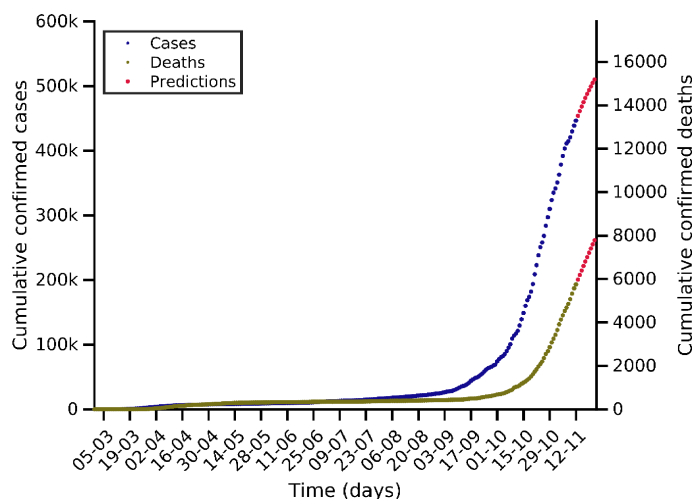
Actual CFR = 1.5 %



Risk diagram (last 15 days)



Czech Rep 12-11-2020. Pop: 10.7M. Cumulative incidence: 4171/10⁵

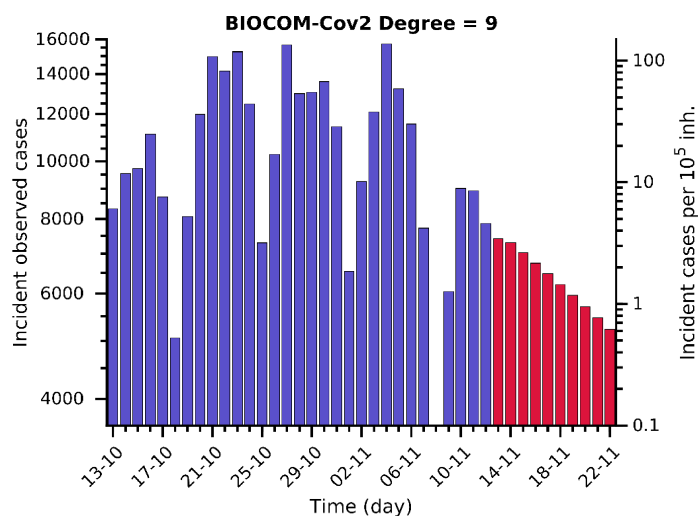
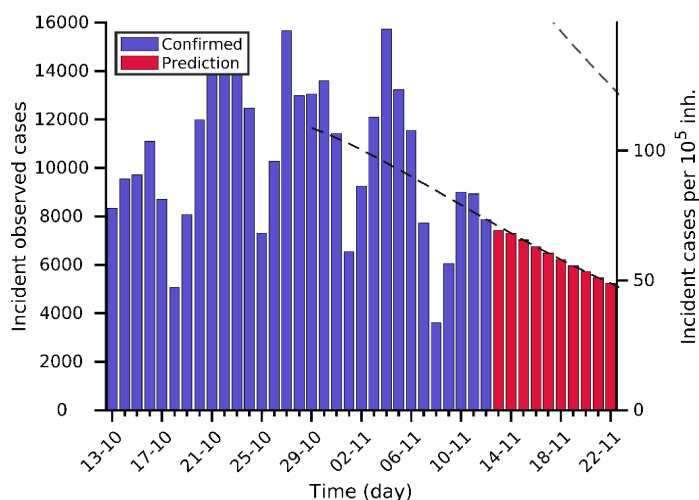


Predictions for next days

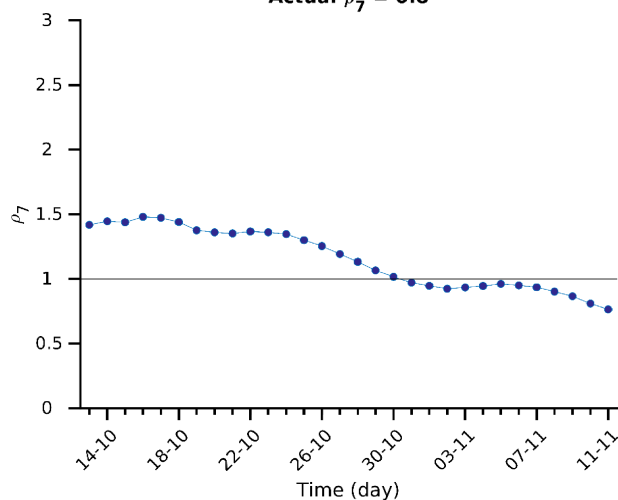
Day	Number of cases	95% Confidence Interval
15-11-2020	468428 (+21753)	[446675 - 658975]
19-11-2020	493841 (+47166)	[446675 - 733389]
22-11-2020	510250 (+63575)	[446675 - 785069]

Current indicators

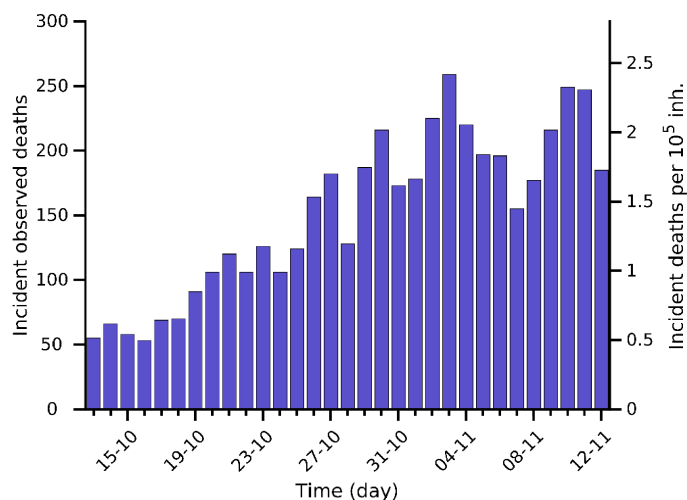
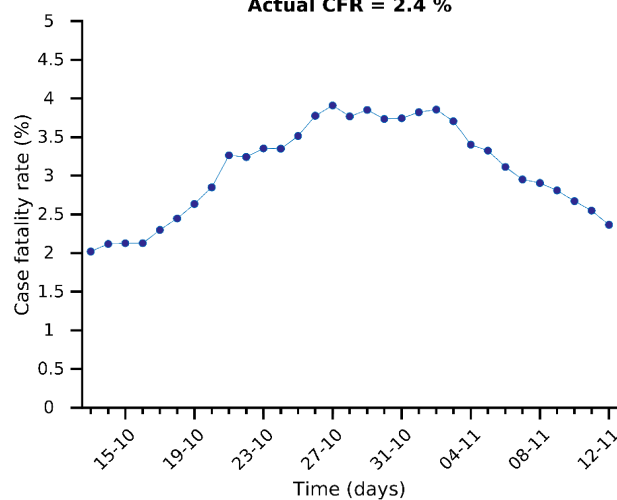
	A14	EPG	CFR	N7	D7
Today	1276	975	2.37 %	7819	204
A Week ago	1577	1490	3.32 %	11697	210
Maximum	1586	1807	4.98 %	12870	210



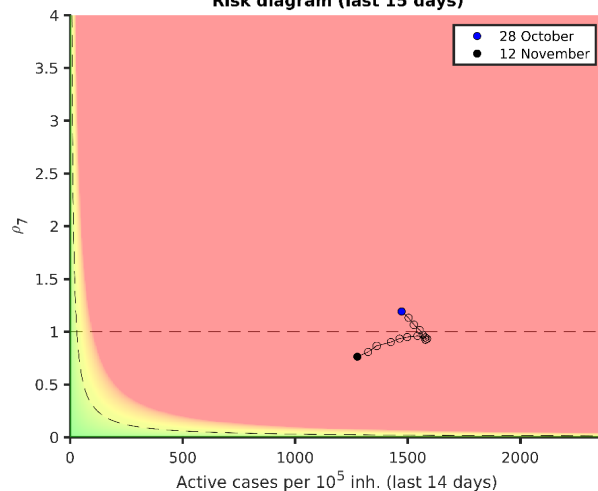
Actual $\rho_7 = 0.8$



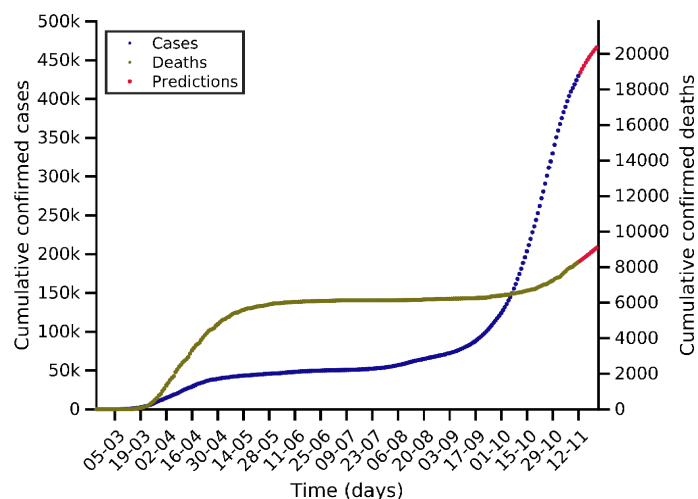
Actual CFR = 2.4 %



Risk diagram (last 15 days)



Netherlands 12-11-2020. Pop: 17.1M. Cumulative incidence: 2509/10⁵

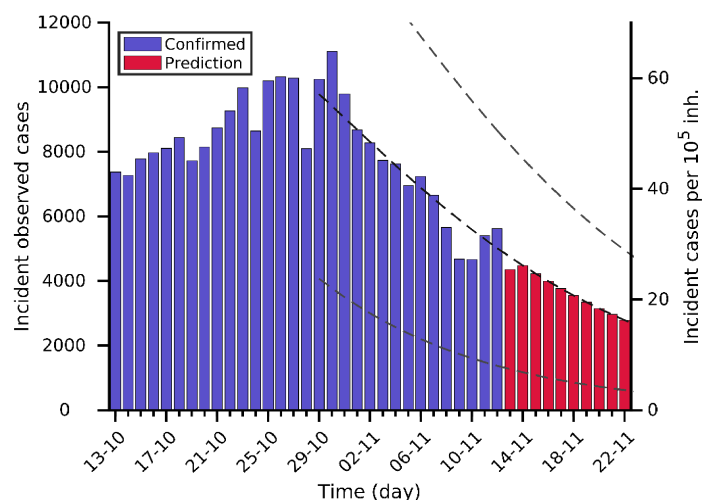


Predictions for next days

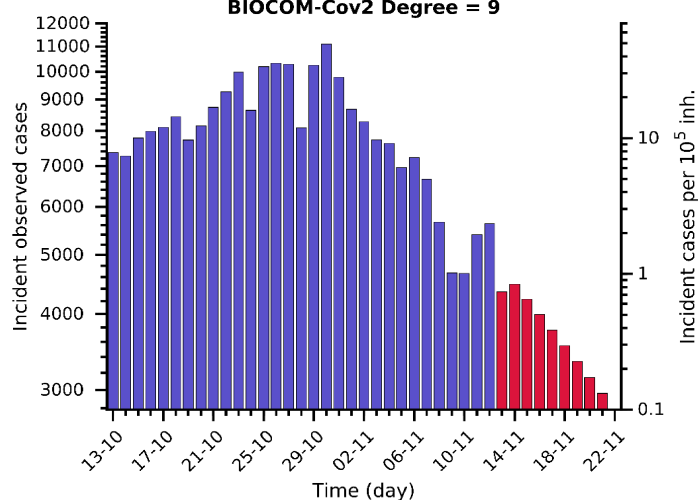
Day	Number of cases	95% Confidence Interval
15-11-2020	442998 (+13060)	[434888 - 451108]
19-11-2020	457648 (+27710)	[448623 - 466673]
22-11-2020	466546 (+36608)	[456464 - 476629]

Current indicators

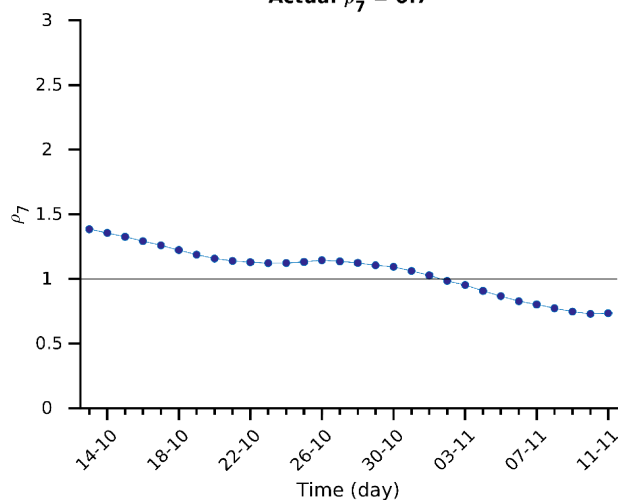
	A14	EPG	CFR	N7	D7
Today	584	429	0.98 %	5702	76
A Week ago	747	677	1.07 %	8593	73
Maximum	769	836	4.98 %	10005	154



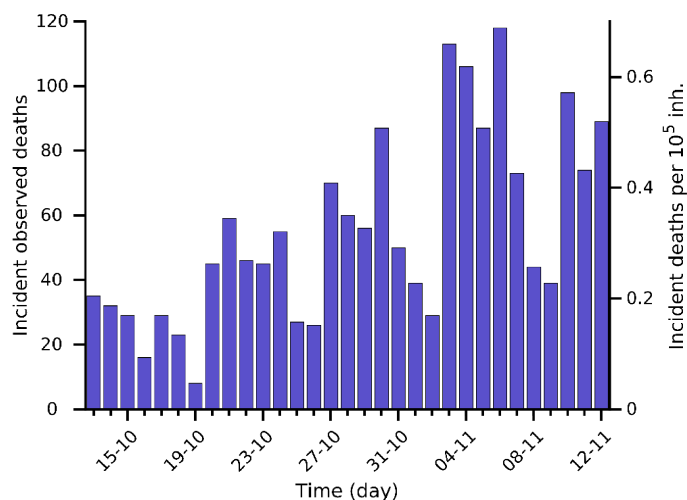
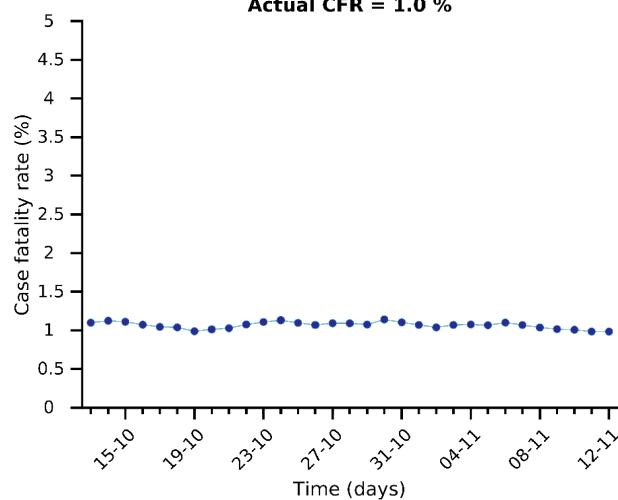
BIOCOM-Cov2 Degree = 9



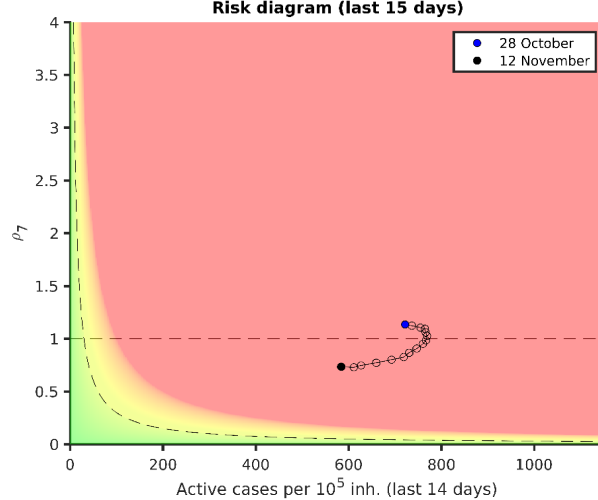
Actual $\rho_7 = 0.7$



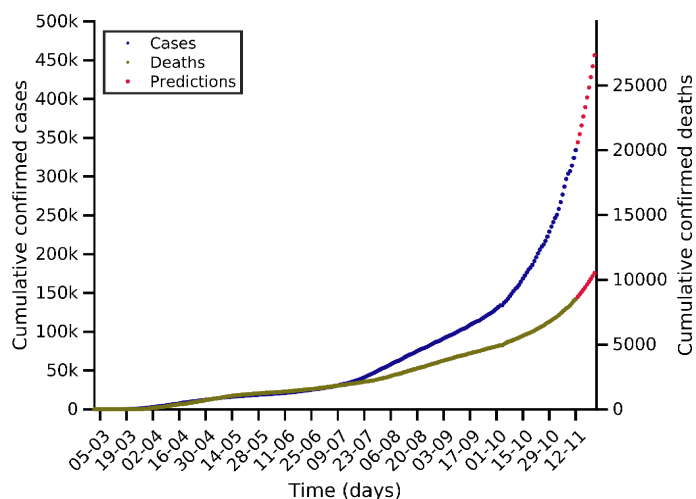
Actual CFR = 1.0 %



Risk diagram (last 15 days)



Romania 12-11-2020. Pop: 19.2M. Cumulative incidence: 1737/10⁵

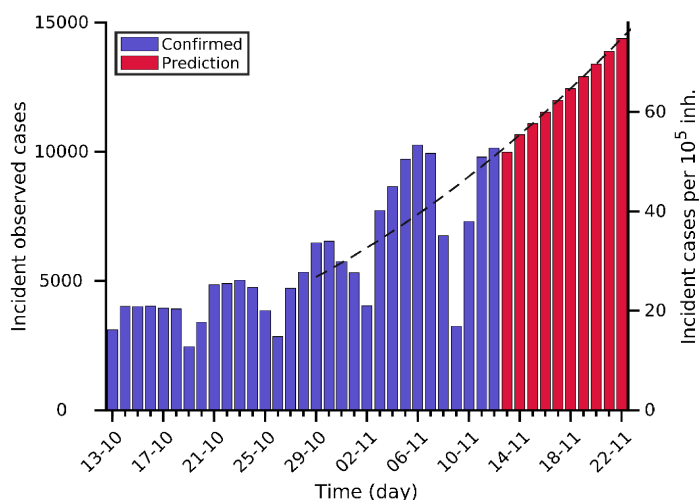


Predictions for next days

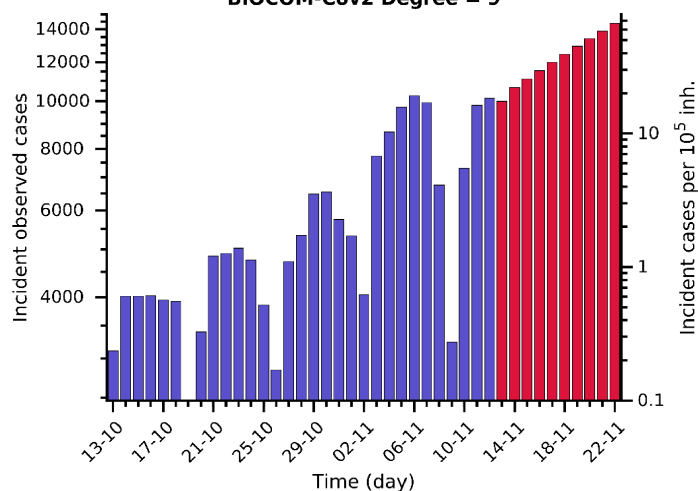
Day	Number of cases	95% Confidence Interval
15-11-2020	365980 (+31744)	[350336 - 381624]
19-11-2020	414861 (+80625)	[370143 - 459578]
22-11-2020	456527 (+122291)	[361055 - 551999]

Current indicators

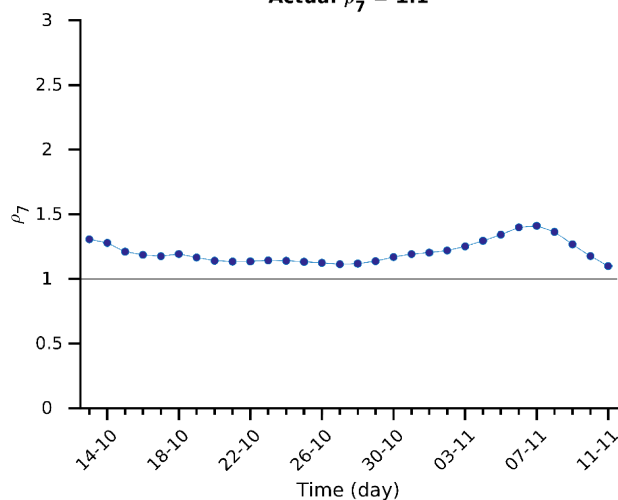
	A14	EPG	CFR	N7	D7
Today	547	601	3.47 %	8205	139
A Week ago	420	544	3.55 %	6823	111
Maximum	547	690	4.96 %	8205	139



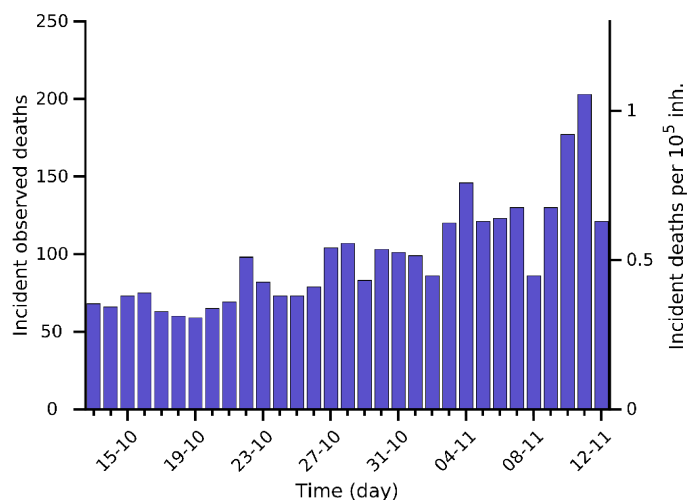
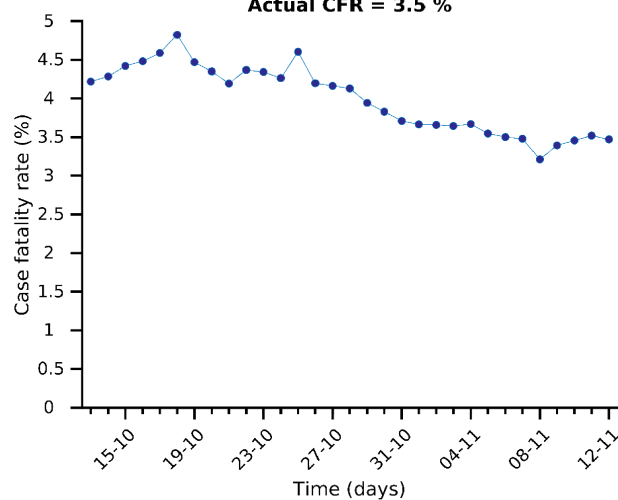
BIOCOM-Cov2 Degree = 9



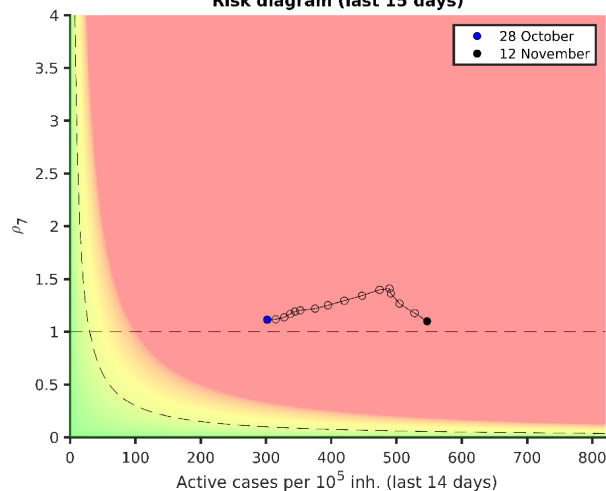
Actual $\rho_7 = 1.1$



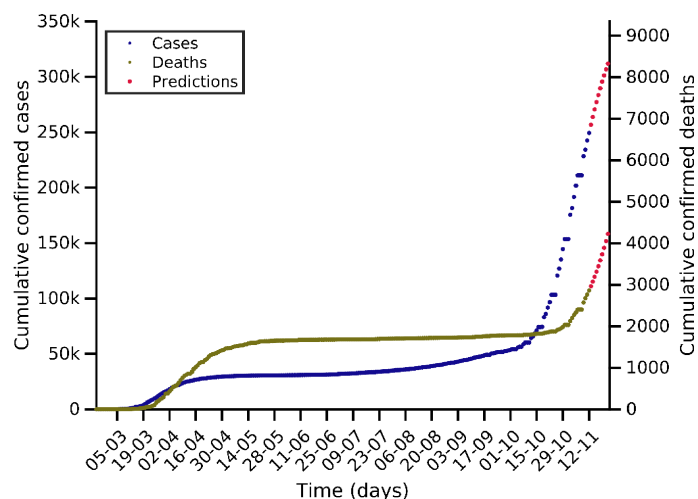
Actual CFR = 3.5 %



Risk diagram (last 15 days)



Switzerland 12-11-2020. Pop: 8.7M. Cumulative incidence: 2883/10⁵

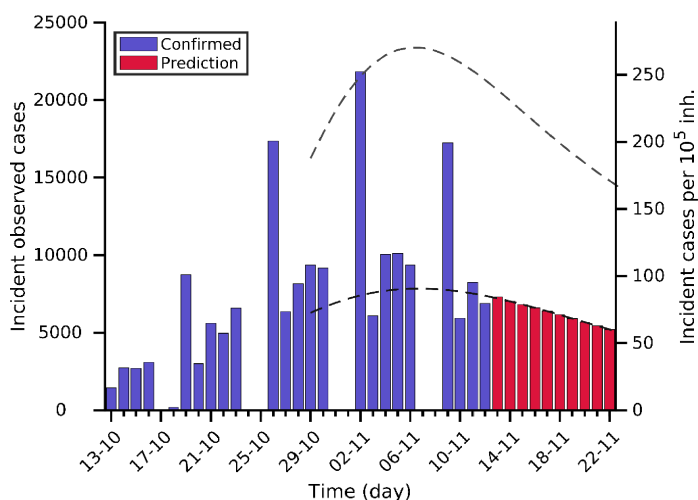


Predictions for next days

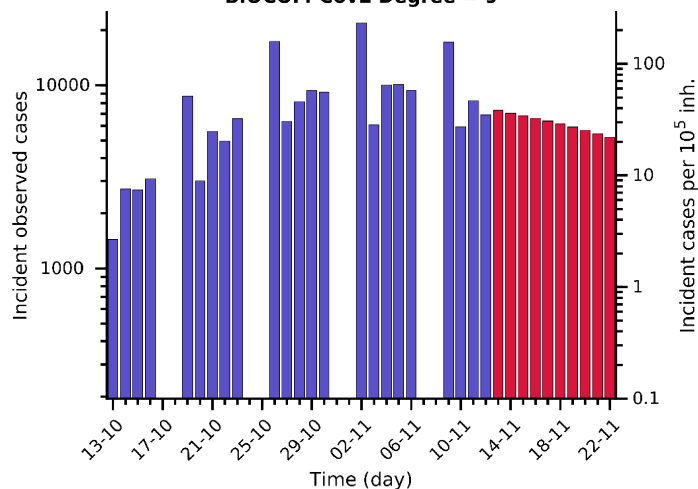
Day	Number of cases	95% Confidence Interval
15-11-2020	270623 (+21152)	[251514 - 289732]
19-11-2020	295674 (+46203)	[263191 - 328158]
22-11-2020	311989 (+62518)	[261184 - 362795]

Current indicators

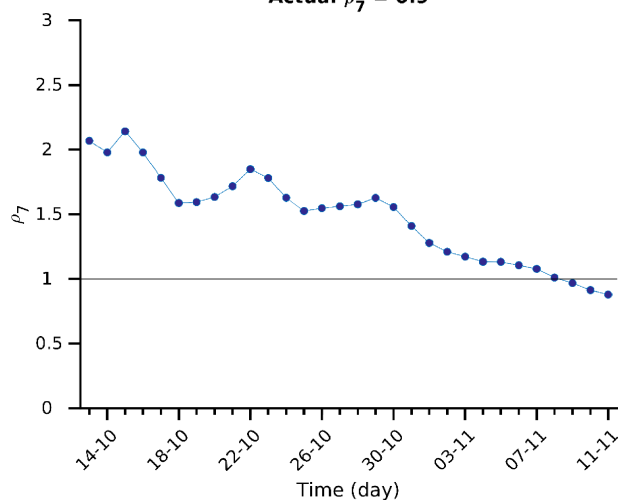
	A14	EPG	CFR	N7	D7
Today	1212	1065	2.31 %	6810	76
A Week ago	1214	1375	2.69 %	8178	50
Maximum	1246	1494	4.98 %	8205	76



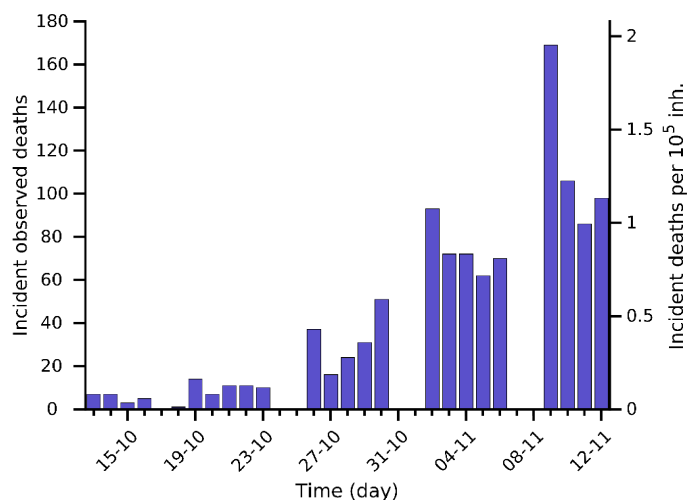
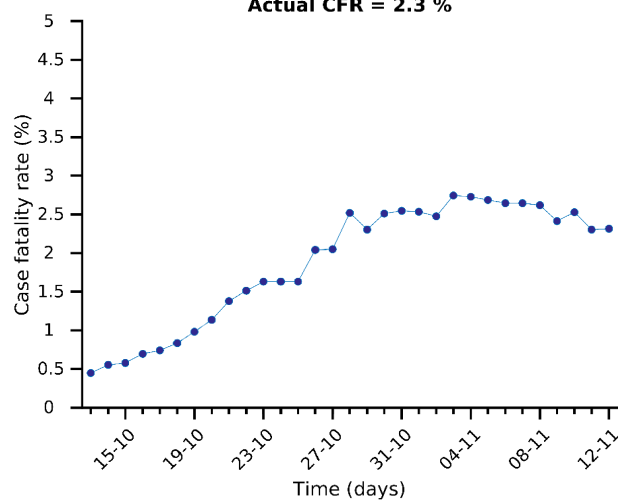
BIOCOM-Cov2 Degree = 9



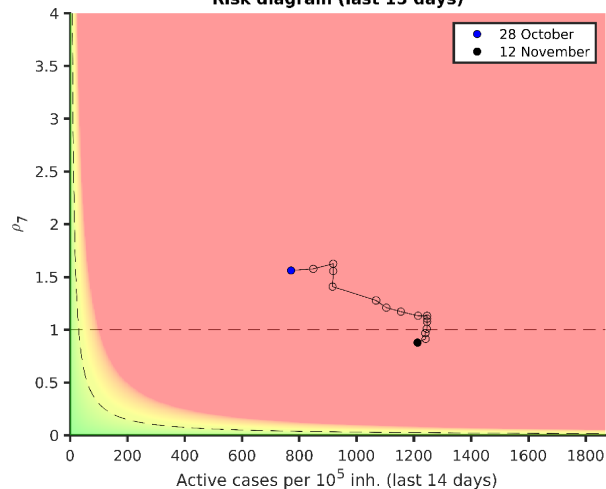
Actual $\rho_7 = 0.9$



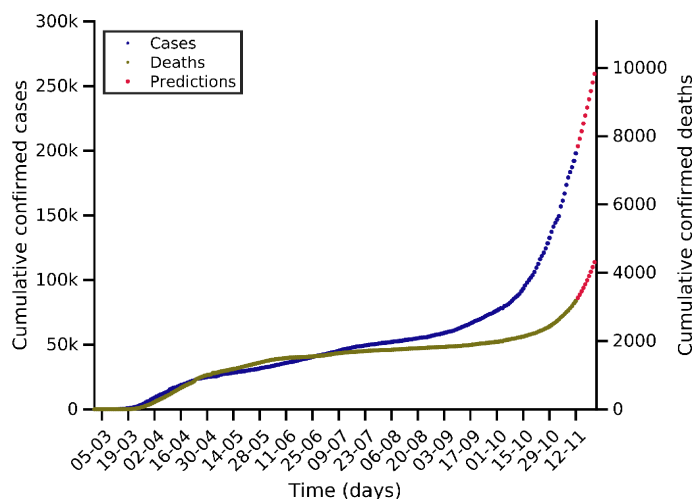
Actual CFR = 2.3 %



Risk diagram (last 15 days)



Portugal 12-11-2020. Pop: 10.2M. Cumulative incidence: 1942/10⁵

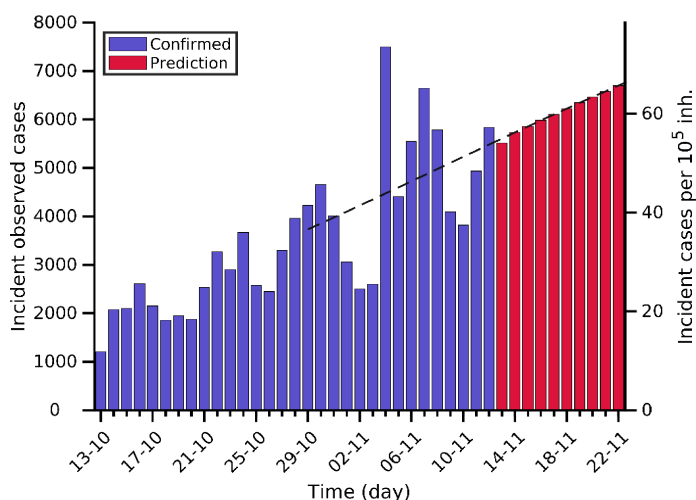


Predictions for next days

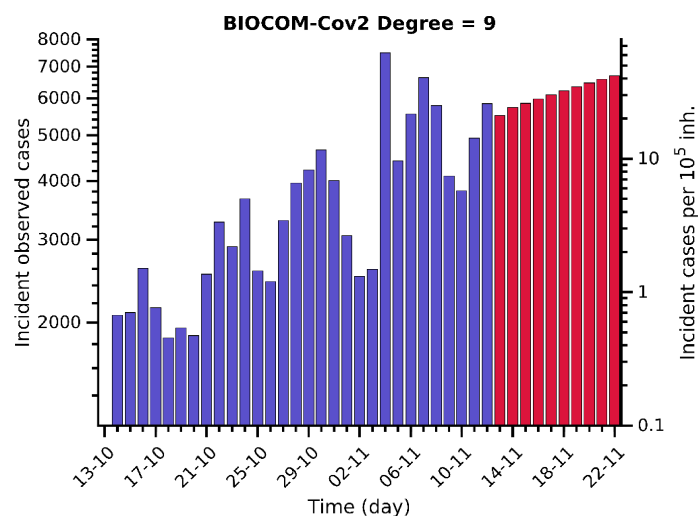
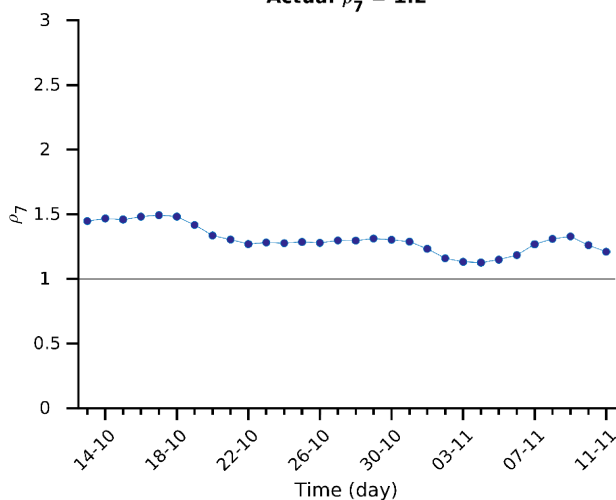
Day	Number of cases	95% Confidence Interval
15-11-2020	215112 (+17101)	[208166 - 222057]
19-11-2020	239763 (+41752)	[222414 - 257112]
22-11-2020	259509 (+61498)	[224796 - 294222]

Current indicators

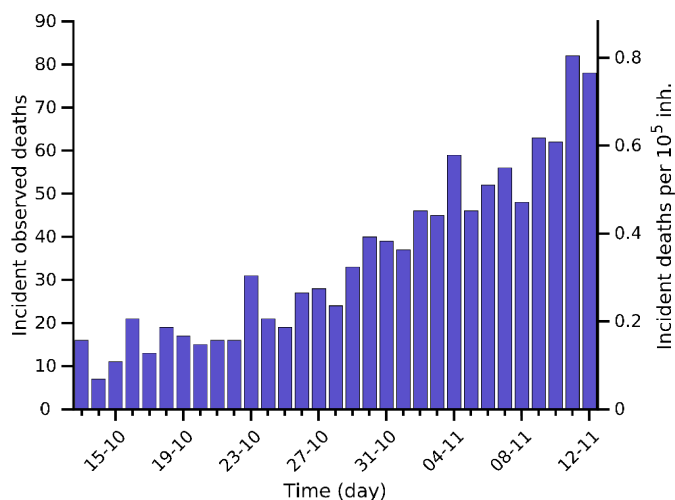
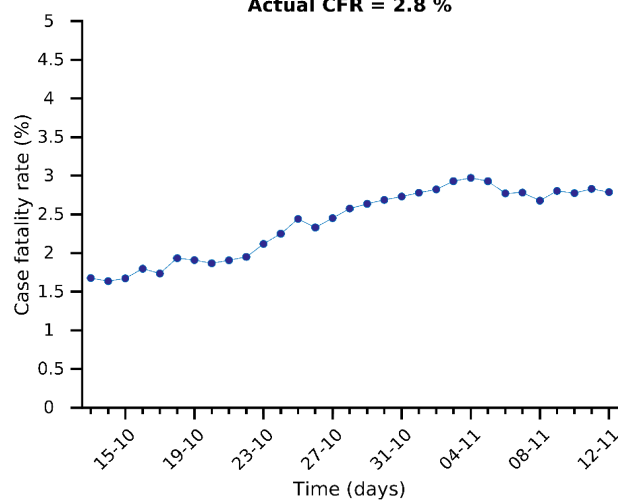
	A14	EPG	CFR	N7	D7
Today	641	776	2.79 %	5237	63
A Week ago	508	572	2.93 %	4105	45
Maximum	641	818	4.98 %	5399	63



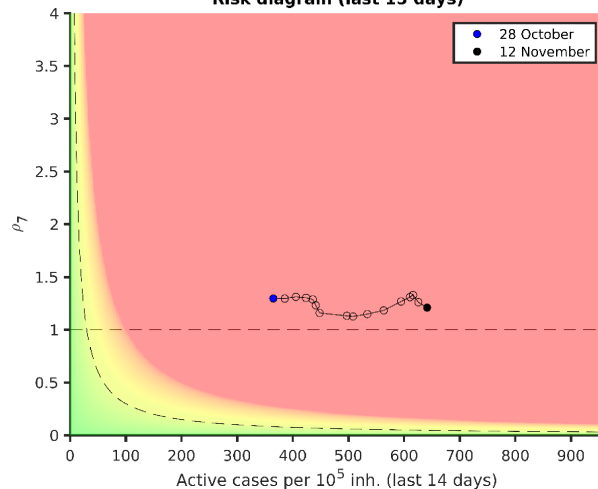
Actual $\rho_7 = 1.2$



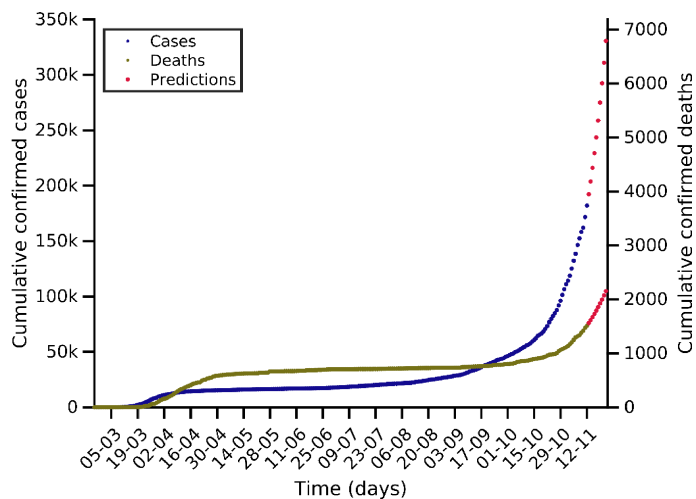
Actual CFR = 2.8 %



Risk diagram (last 15 days)



Austria 12-11-2020. Pop: 9.0M. Cumulative incidence: 2021/10⁵

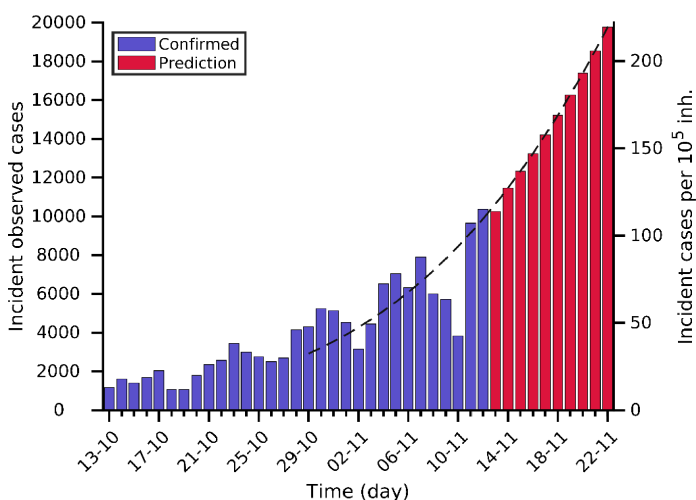


Predictions for next days

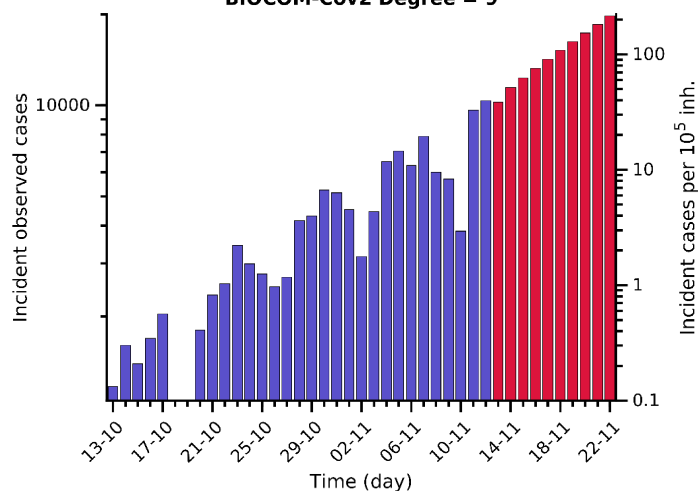
Day	Number of cases	95% Confidence Interval
15-11-2020	216119 (+34057)	[195358 - 236879]
19-11-2020	275050 (+92988)	[200169 - 349930]
22-11-2020	330745 (+148683)	[182062 - 506545]

Current indicators

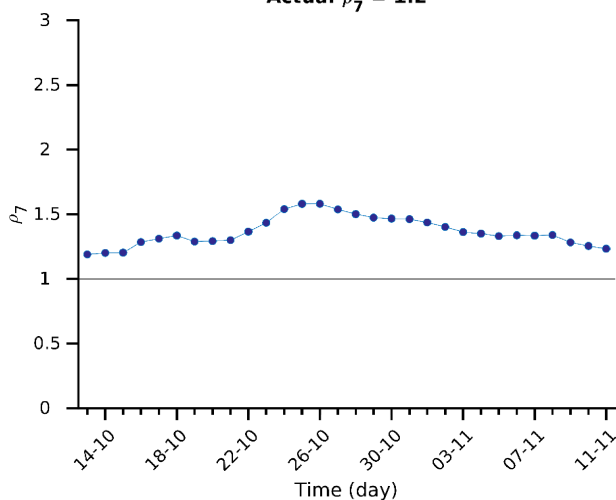
	A14	EPG	CFR	N7	D7
Today	953	1176	2.15 %	7112	37
A Week ago	654	884	2.04 %	5154	27
Maximum	953	1176	4.93 %	7112	38



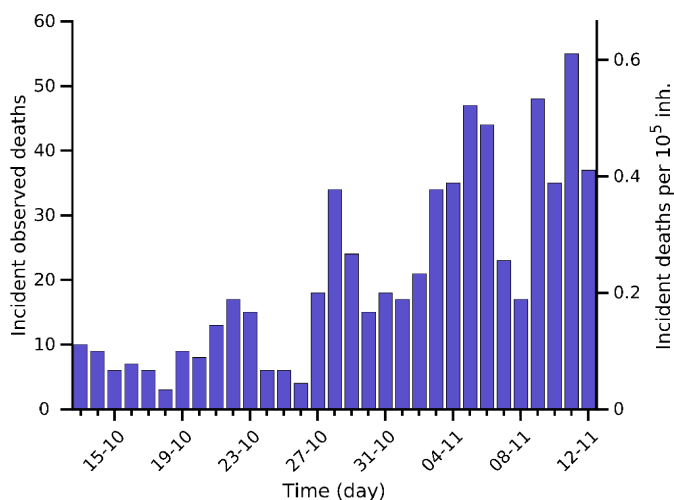
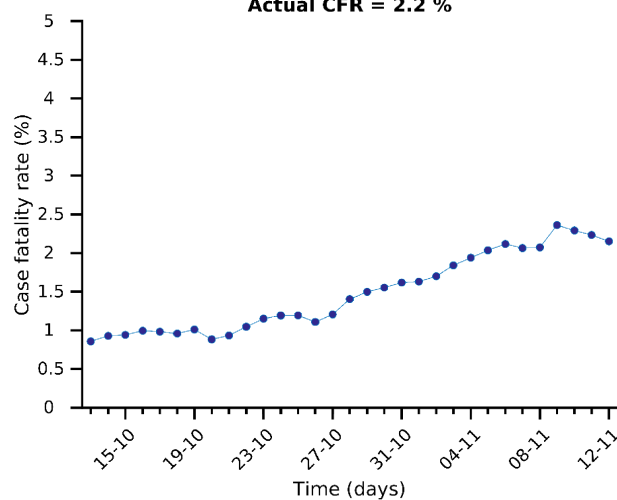
BIOCOM-Cov2 Degree = 9



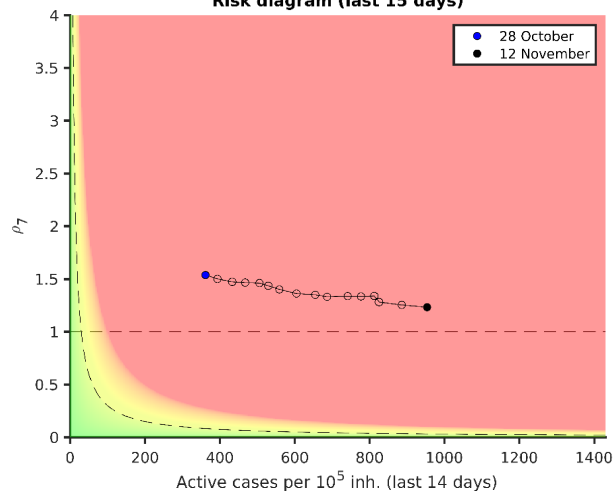
Actual $\rho_7 = 1.2$



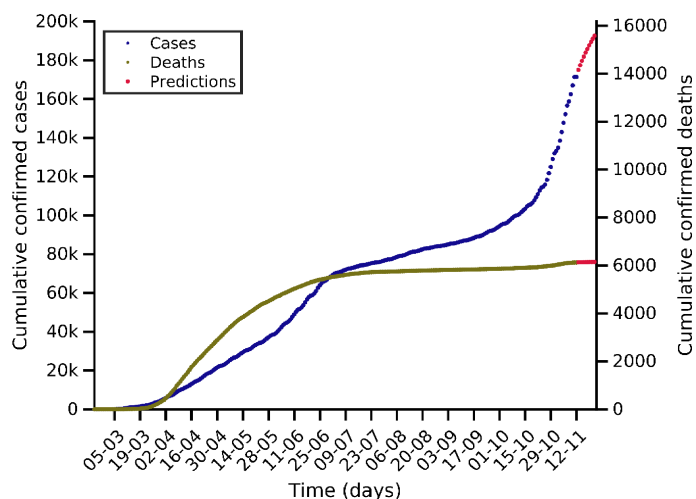
Actual CFR = 2.2 %



Risk diagram (last 15 days)



Sweden 12-11-2020. Pop: 10.1M. Cumulative incidence: 1697/10⁵

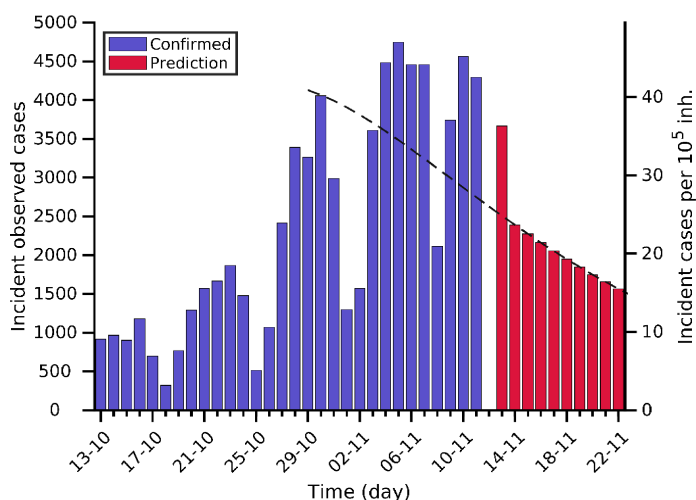


Predictions for next days

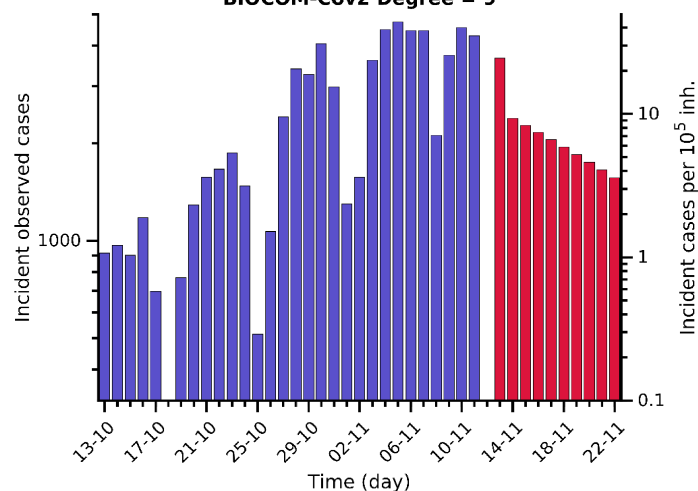
Day	Number of cases	95% Confidence Interval
15-11-2020	179693 (+8328)	[171365 - 201311]
19-11-2020	187703 (+16338)	[171365 - 220871]
22-11-2020	192671 (+21306)	[171365 - 241444]

Current indicators

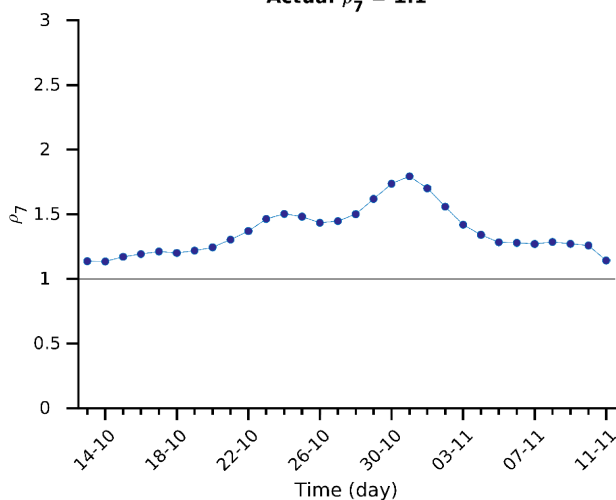
	A14	EPG	CFR	N7	D7
Today	459	525	1.07 %	3375	7
A Week ago	364	488	1.59 %	3250	12
Maximum	492	619	4.87 %	4080	99



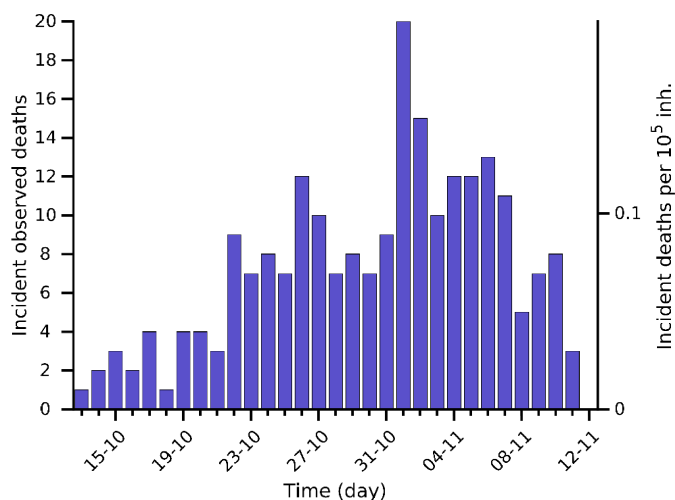
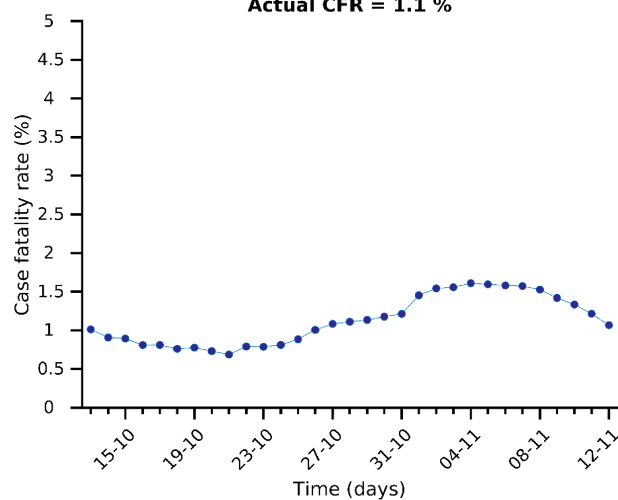
BIOCOM-Cov2 Degree = 9



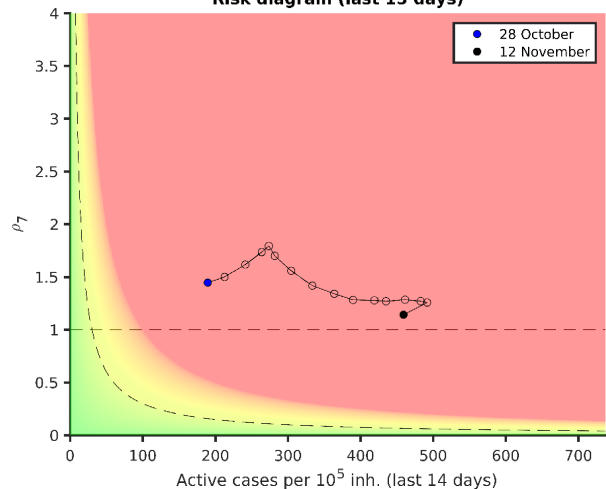
Actual $\rho_7 = 1.1$



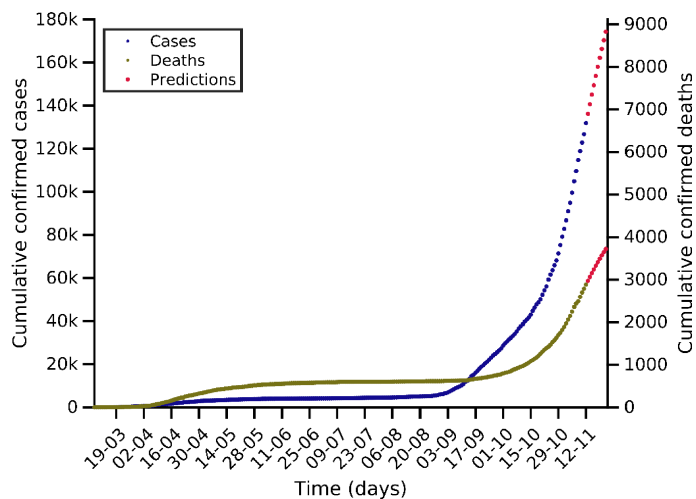
Actual CFR = 1.1 %



Risk diagram (last 15 days)



Hungary 12-11-2020. Pop: 9.7M. Cumulative incidence: 1365/10⁵

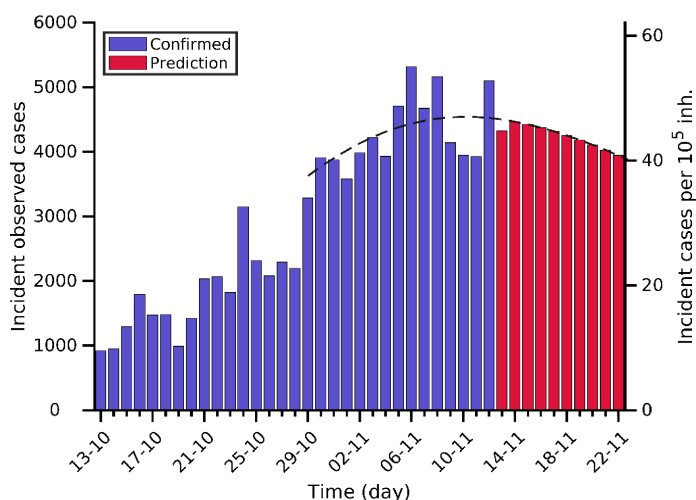


Predictions for next days

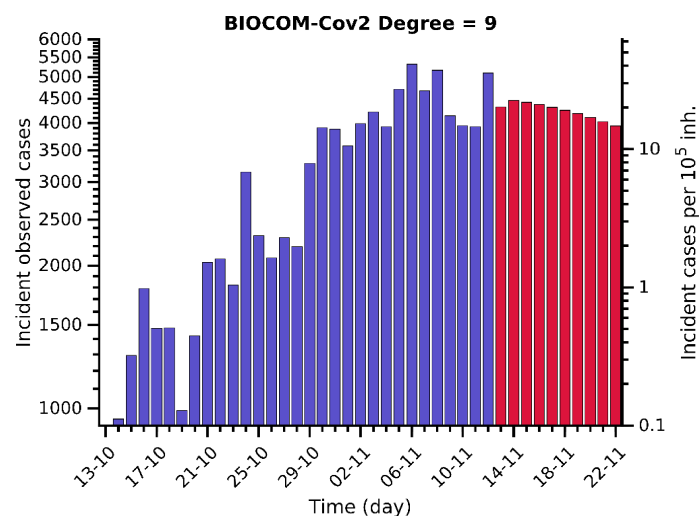
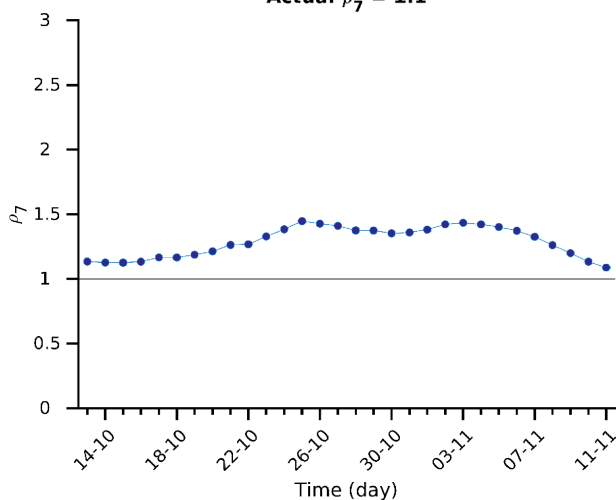
Day	Number of cases	95% Confidence Interval
15-11-2020	145100 (+13213)	[139776 - 150424]
19-11-2020	162227 (+30340)	[151925 - 172528]
22-11-2020	174305 (+42418)	[156663 - 191946]

Current indicators

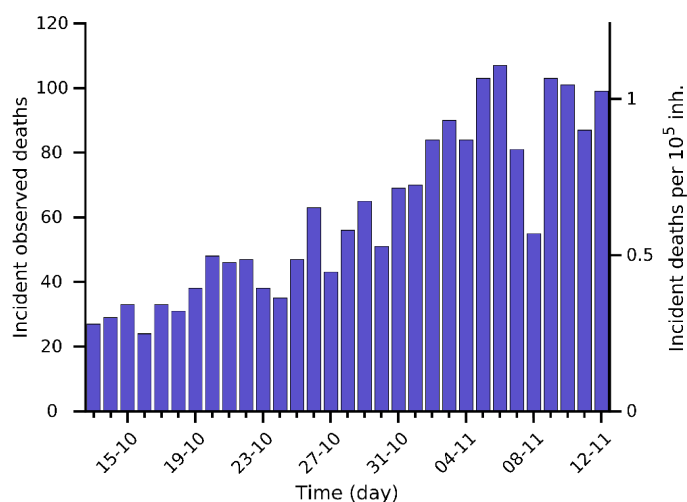
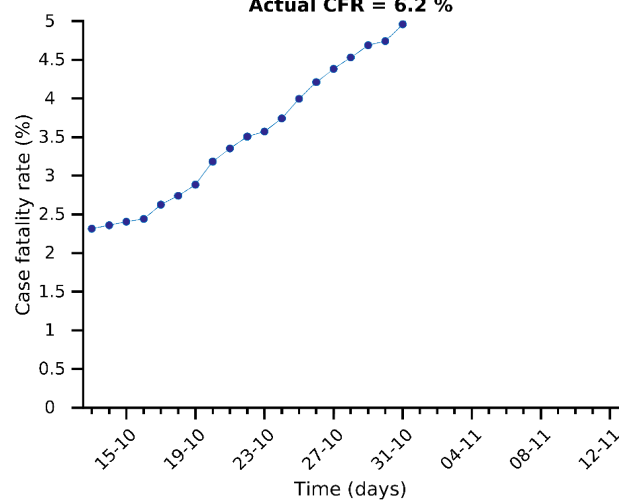
	A14	EPG	CFR	N7	D7
Today	626	681	6.21 %	4609	90
A Week ago	469	667	6.24 %	4030	79
Maximum	626	731	4.96 %	4609	91



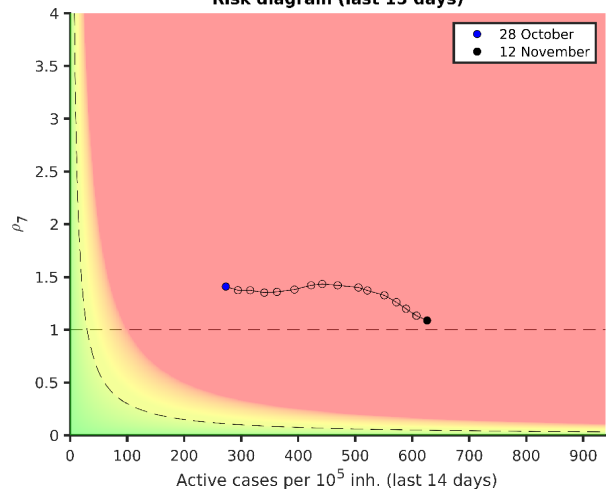
Actual $\rho_7 = 1.1$



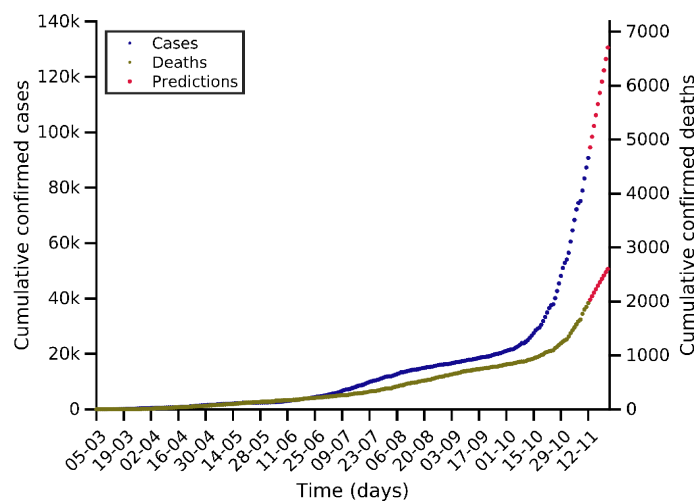
Actual CFR = 6.2 %



Risk diagram (last 15 days)



Bulgaria 12-11-2020. Pop: 6.9M. Cumulative incidence: 1306/10⁵

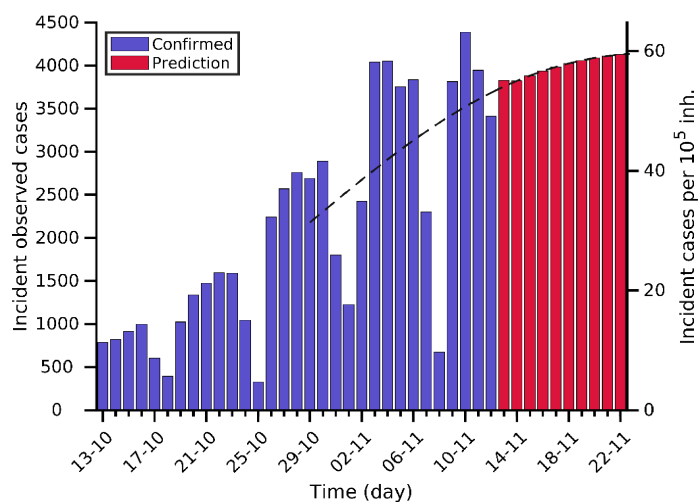


Predictions for next days

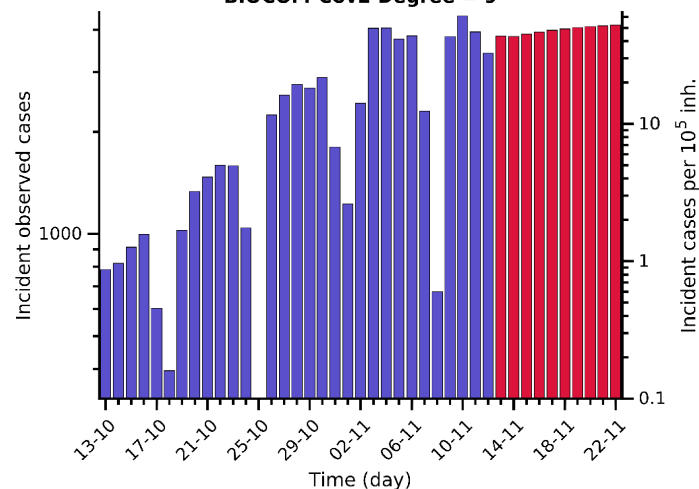
Day	Number of cases	95% Confidence Interval
15-11-2020	102261 (+11536)	[97135 - 107387]
19-11-2020	118271 (+27546)	[106408 - 130133]
22-11-2020	130600 (+39875)	[108121 - 153079]

Current indicators

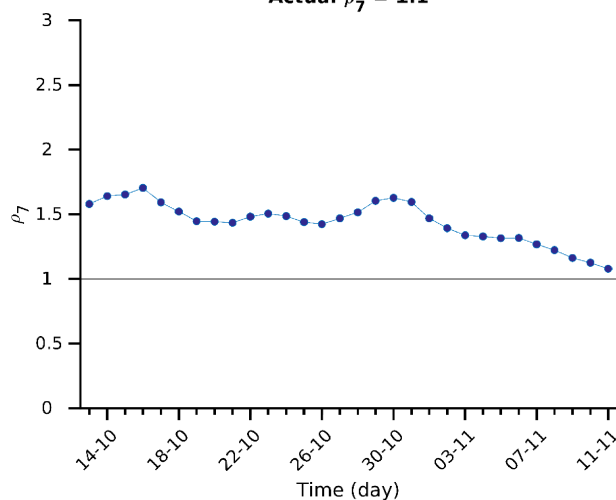
	A14	EPG	CFR	N7	D7
Today	613	661	6.38 %	3197	65
A Week ago	481	639	7.08 %	2885	42
Maximum	613	700	4.99 %	3261	65



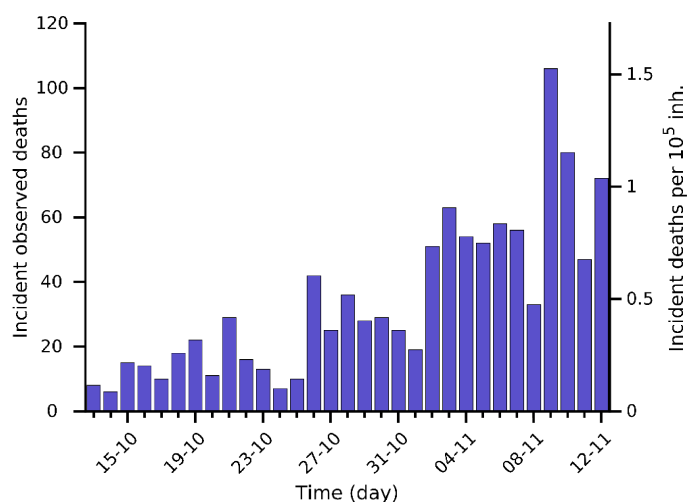
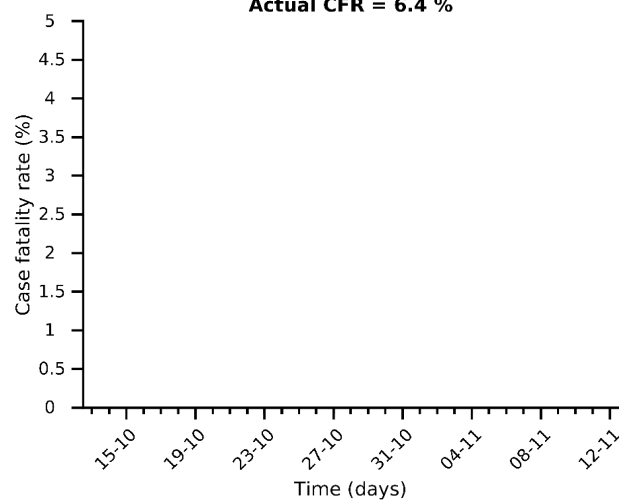
BIOCOM-Cov2 Degree = 9



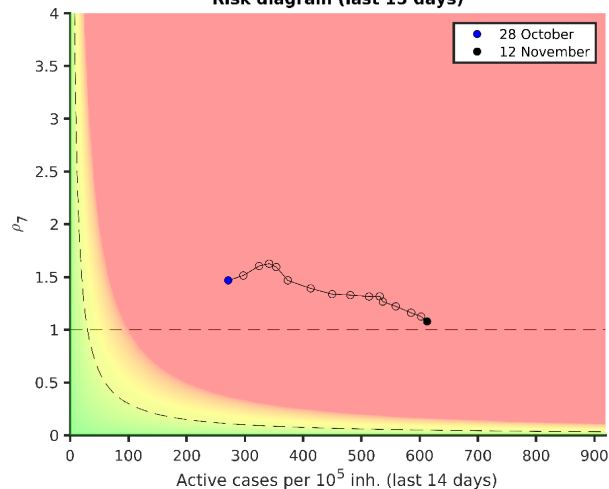
Actual $\rho_7 = 1.1$



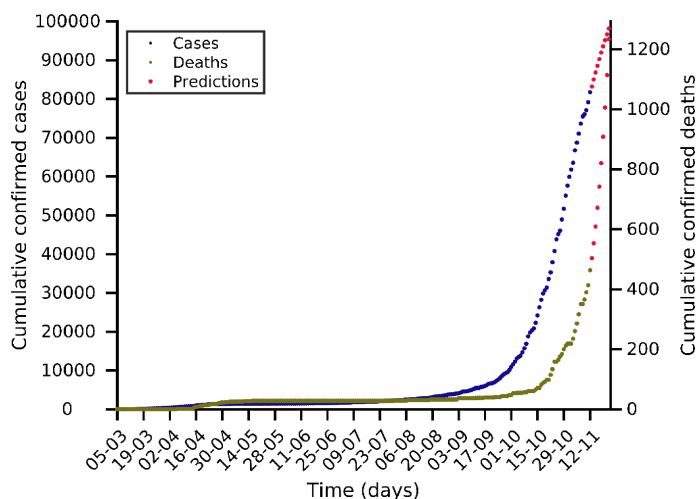
Actual CFR = 6.4 %



Risk diagram (last 15 days)



Slovakia 12-11-2020. Pop: 5.5M. Cumulative incidence: 1498/10⁵

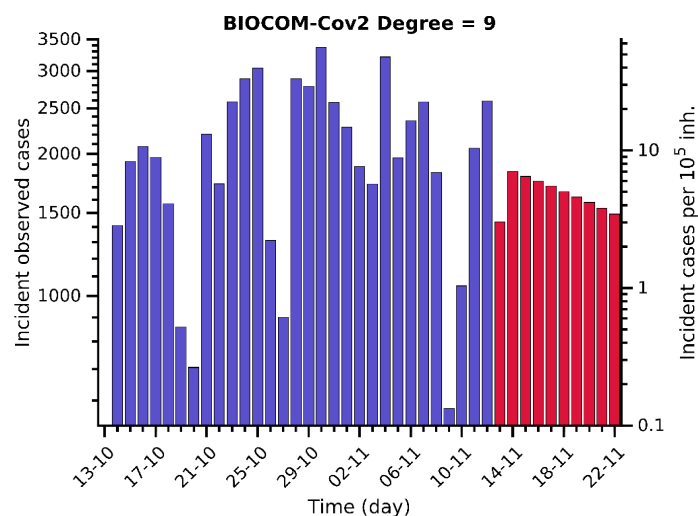
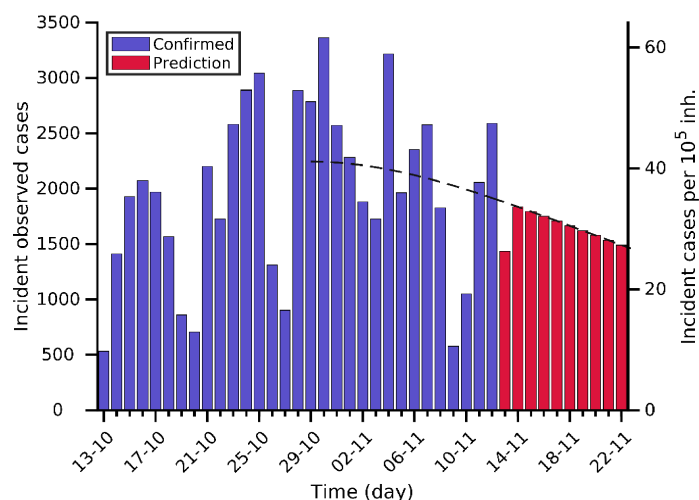


Predictions for next days

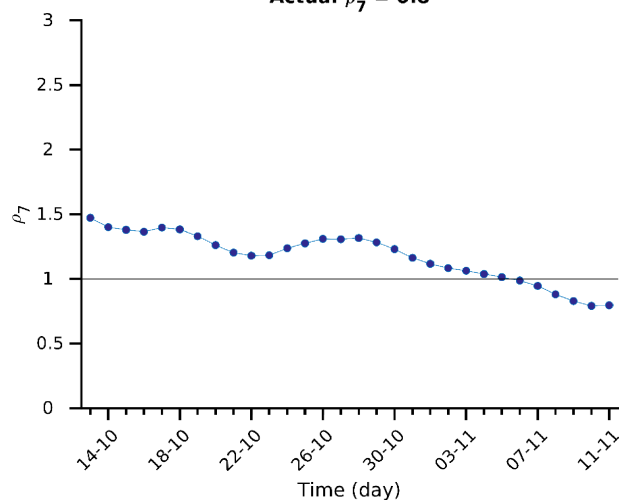
Day	Number of cases	95% Confidence Interval
15-11-2020	86837 (+5065)	[81772 - 1249850]
19-11-2020	93584 (+11812)	[81772 - 752506]
22-11-2020	98188 (+16416)	[81772 - 1323116]

Current indicators

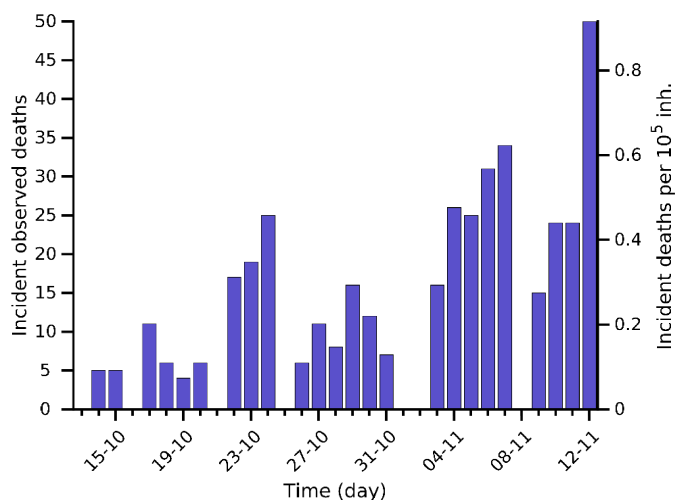
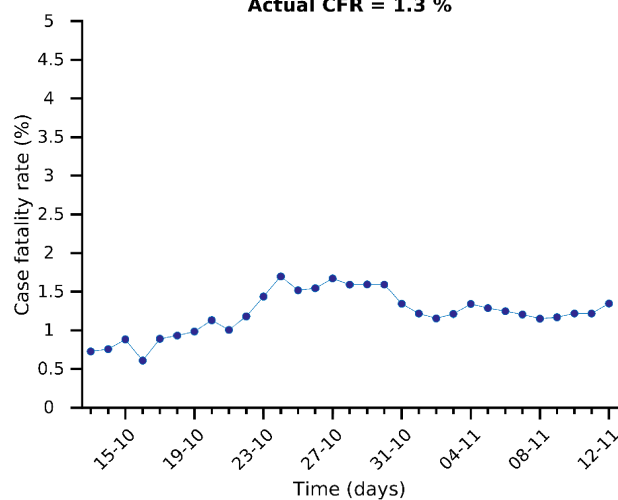
	A14	EPG	CFR	N7	D7
Today	550	438	1.35 %	1863	25
A Week ago	612	635	1.29 %	2429	12
Maximum	612	676	4.79 %	2547	25



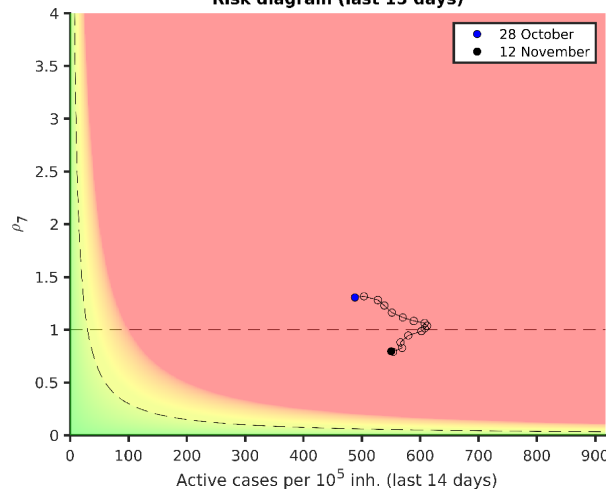
Actual $\rho_7 = 0.8$



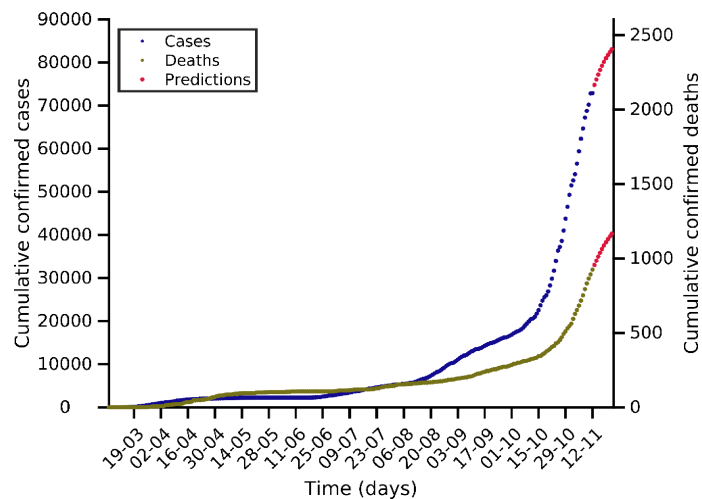
Actual CFR = 1.3 %



Risk diagram (last 15 days)



Croatia 12-11-2020. Pop: 4.1M. Cumulative incidence: 1776/10⁵

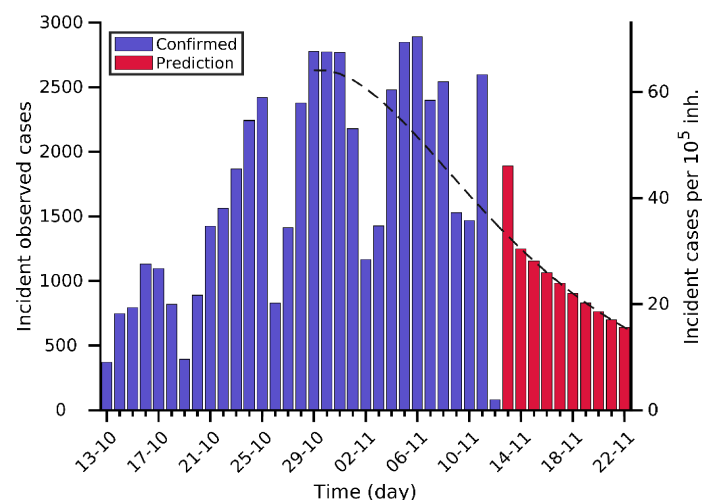


Predictions for next days

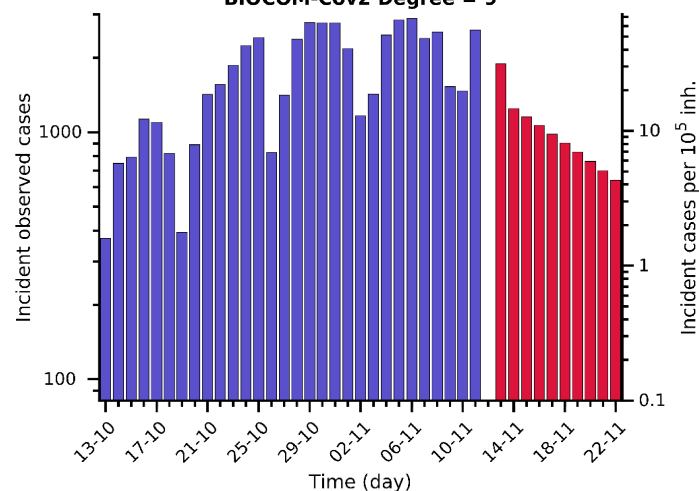
Day	Number of cases	95% Confidence Interval
15-11-2020	77216 (+4294)	[72922 - 87570]
19-11-2020	80999 (+8077)	[72922 - 94890]
22-11-2020	83100 (+10178)	[72922 - 101238]

Current indicators

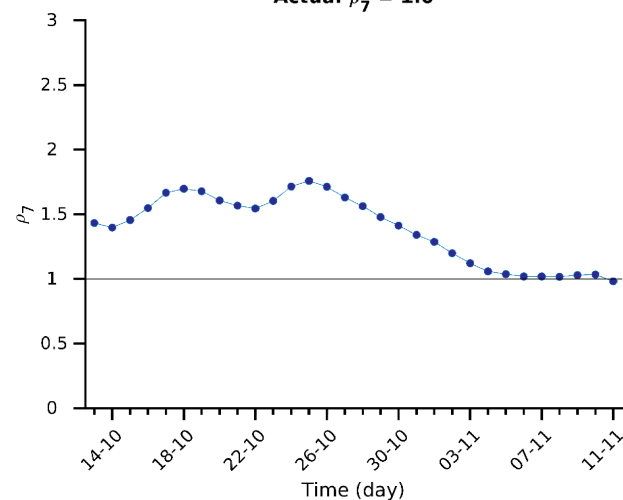
	A14	EPG	CFR	N7	D7
Today	710	697	3.81 %	1930	35
A Week ago	720	762	4.85 %	2234	25
Maximum	776	846	4.90 %	2325	35



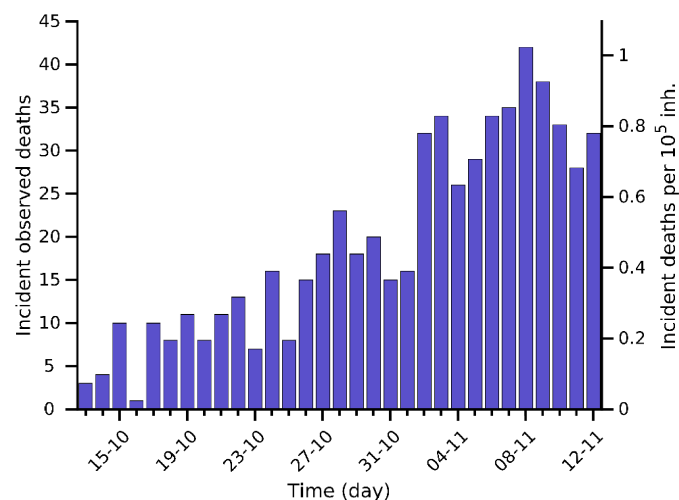
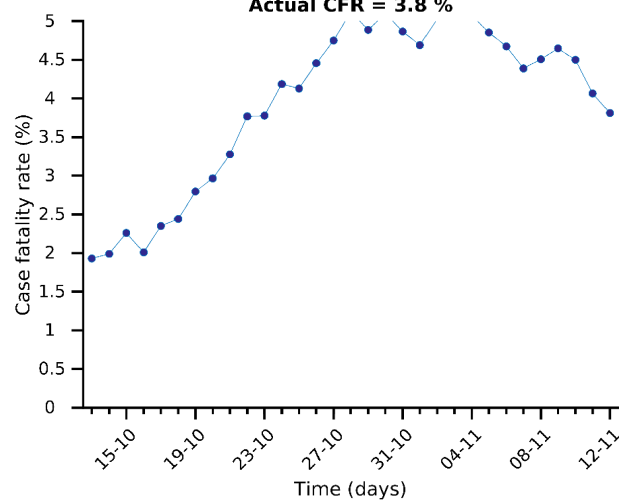
BIOCOM-Cov2 Degree = 9



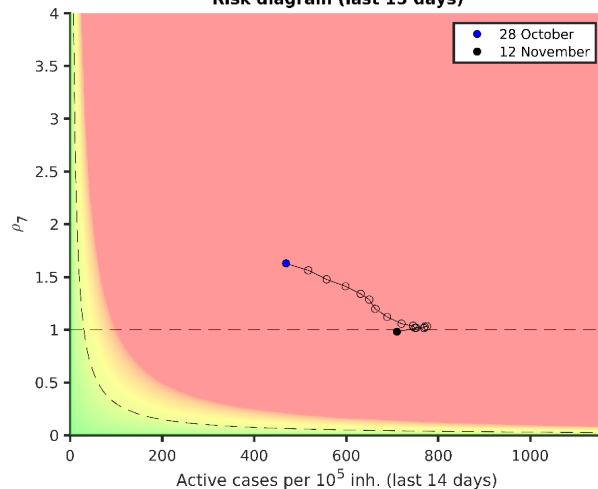
Actual $\rho_7 = 1.0$



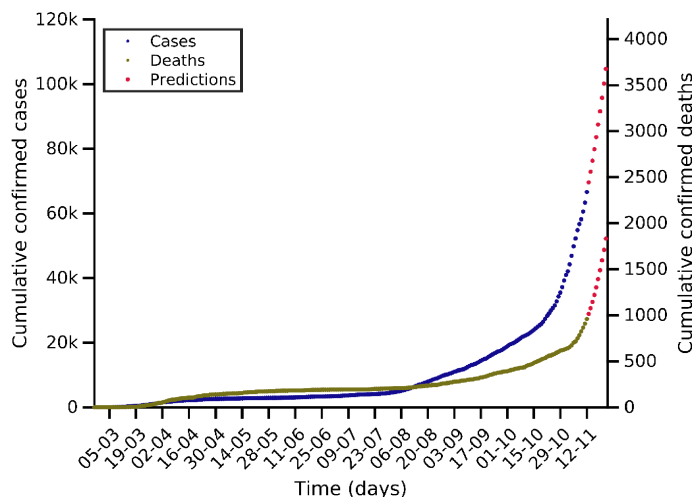
Actual CFR = 3.8 %



Risk diagram (last 15 days)



Greece 12-11-2020. Pop: 10.4M. Cumulative incidence: 639/10⁵

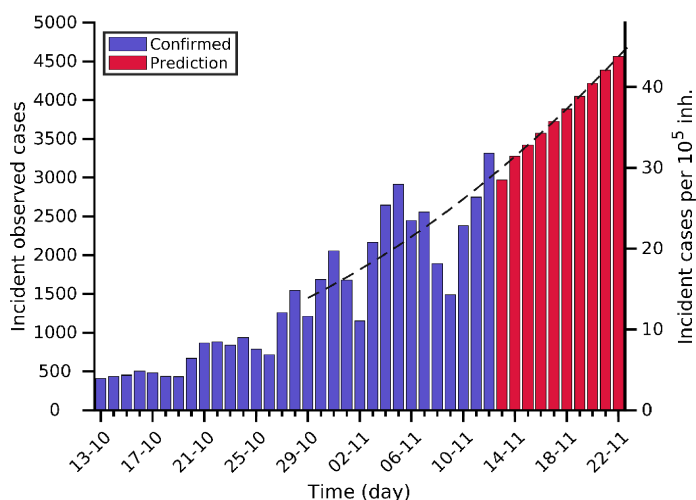


Predictions for next days

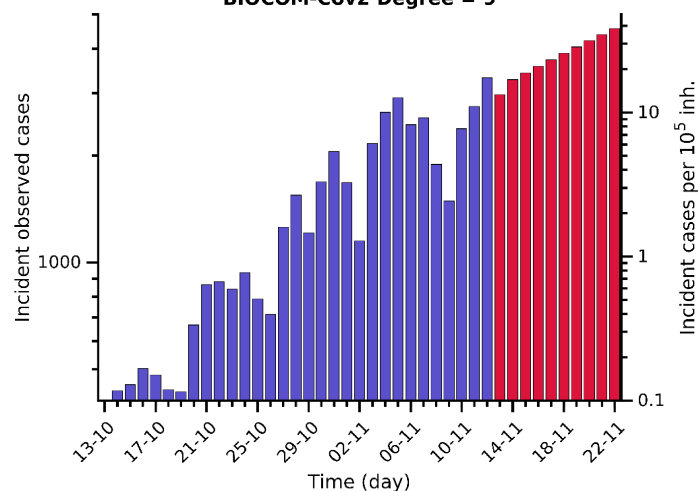
Day	Number of cases	95% Confidence Interval
15-11-2020	76302 (+9665)	[71518 - 81086]
19-11-2020	91539 (+24902)	[77460 - 105619]
22-11-2020	104704 (+38067)	[74280 - 135127]

Current indicators

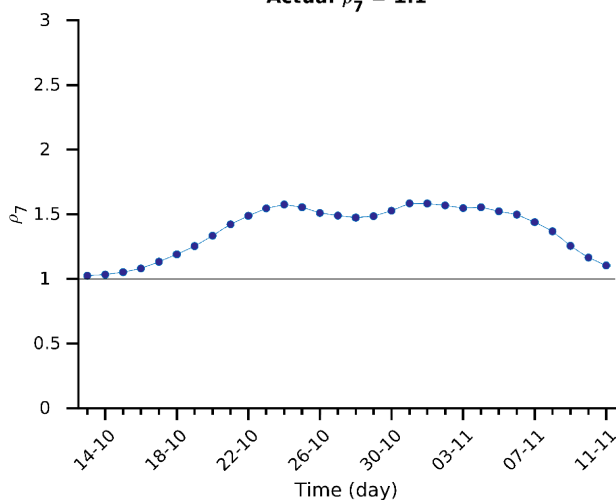
	A14	EPG	CFR	N7	D7
Today	299	330	5.03 %	2404	37
A Week ago	207	322	3.02 %	2042	12
Maximum	299	358	4.95 %	2404	37



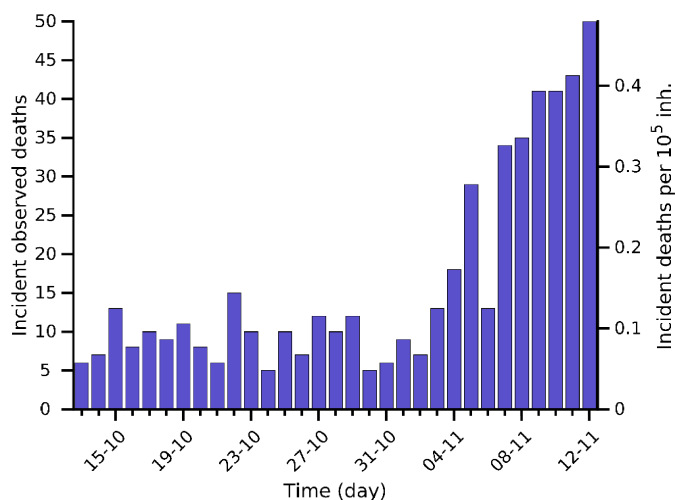
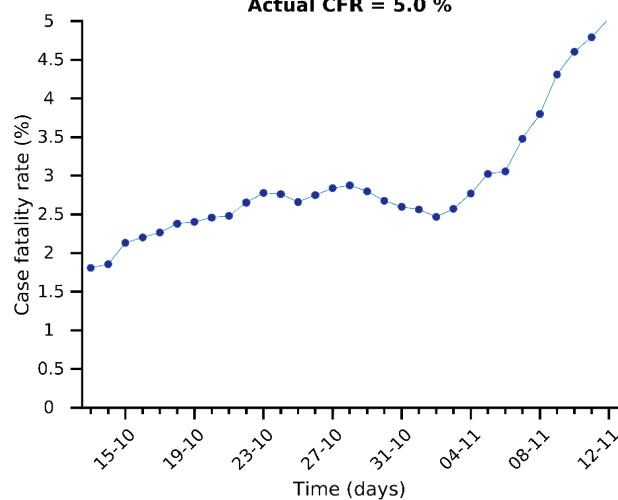
BIOCOM-Cov2 Degree = 9



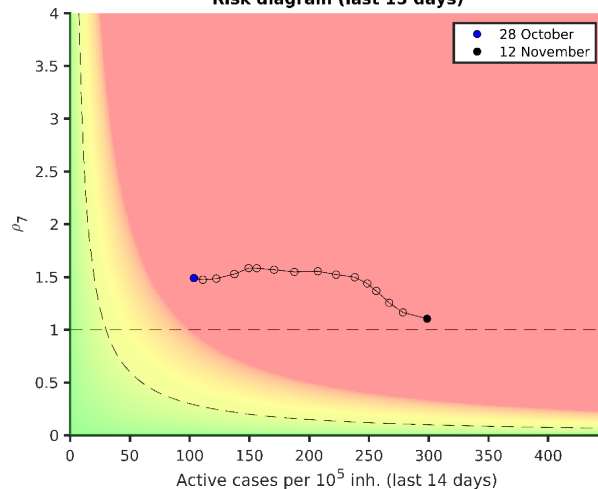
Actual $\rho_7 = 1.1$



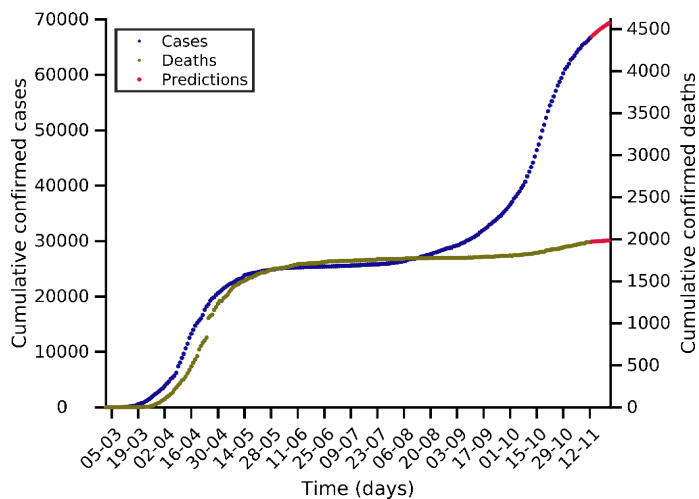
Actual CFR = 5.0 %



Risk diagram (last 15 days)



Ireland 12-11-2020. Pop: 4.9M. Cumulative incidence: 1349/10⁵

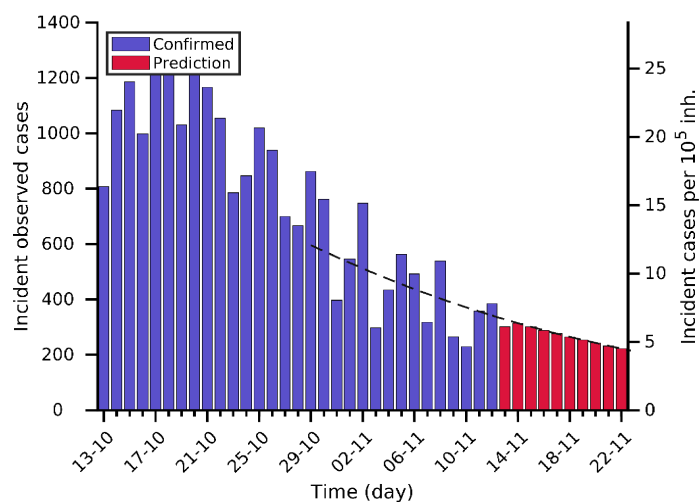


Predictions for next days

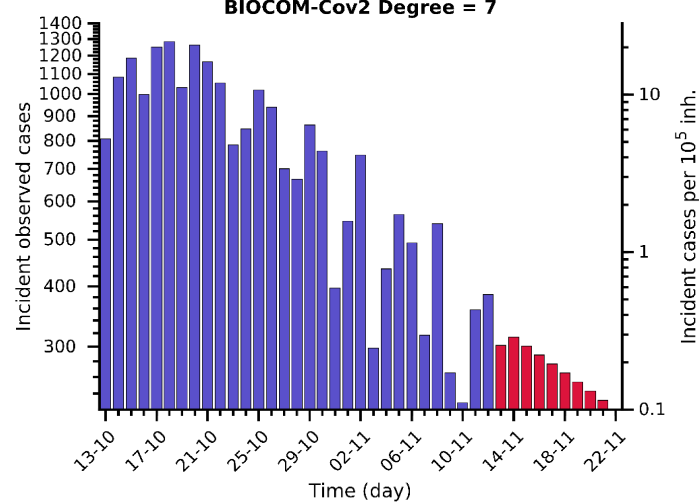
Day	Number of cases	95% Confidence Interval
15-11-2020	67549 (+917)	[66944 - 68154]
19-11-2020	68632 (+2000)	[67958 - 69307]
22-11-2020	69330 (+2698)	[68554 - 70106]

Current indicators

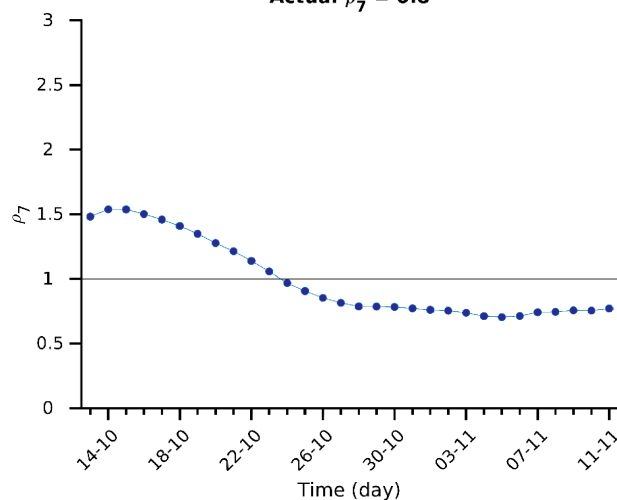
	A14	EPG	CFR	N7	D7
Today	128	99	0.44 %	369	5
A Week ago	194	138	0.63 %	536	4
Maximum	298	363	4.93 %	1168	70



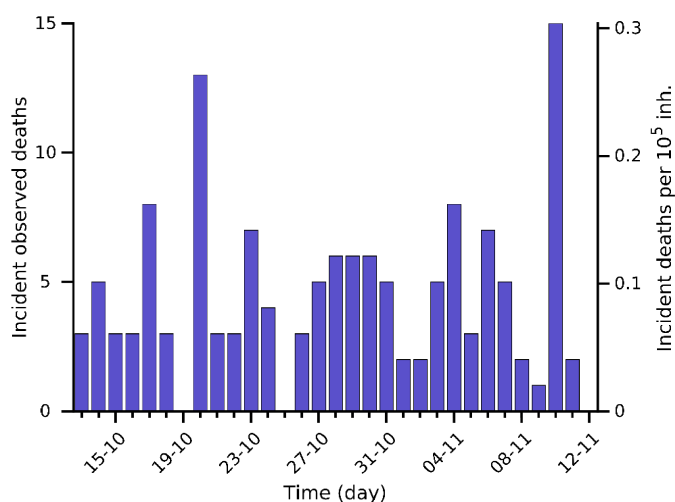
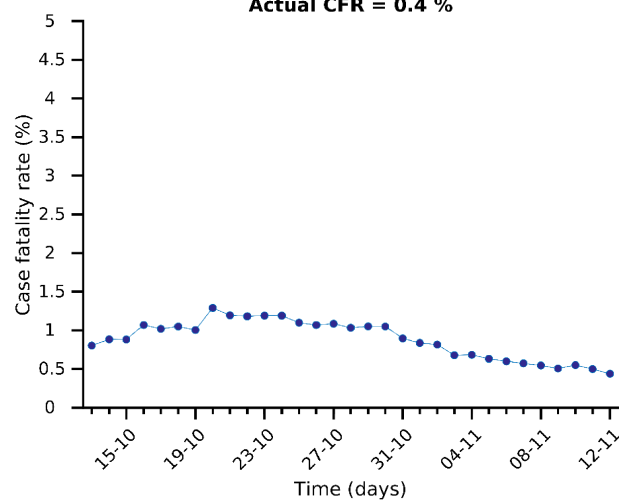
BIOCOM-Cov2 Degree = 7



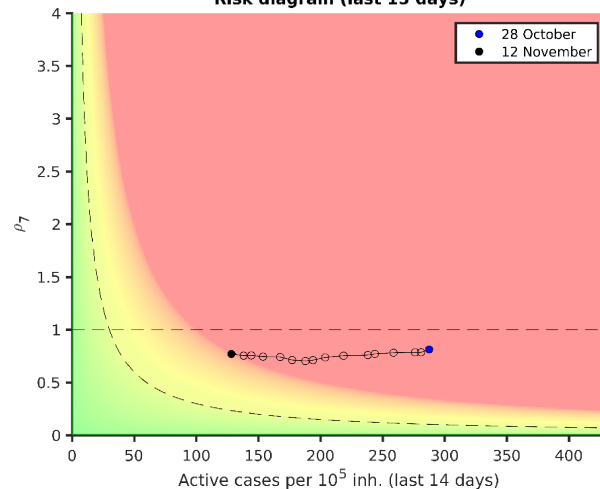
Actual $\rho_7 = 0.8$



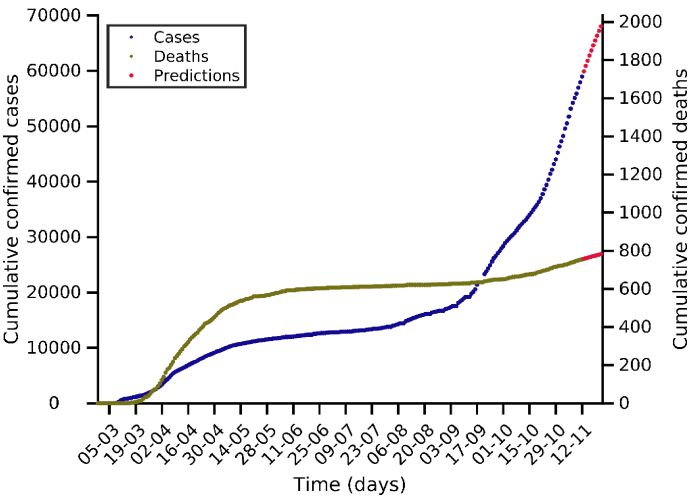
Actual CFR = 0.4 %



Risk diagram (last 15 days)



Denmark 12-11-2020. Pop: 5.8M. Cumulative incidence: 1018/10⁵

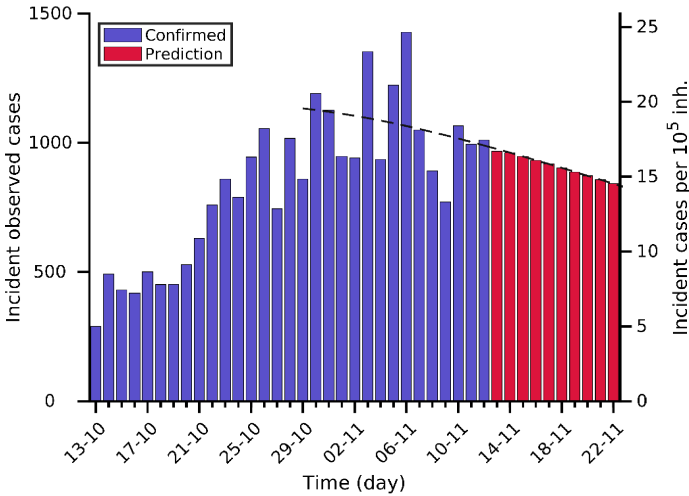


Predictions for next days

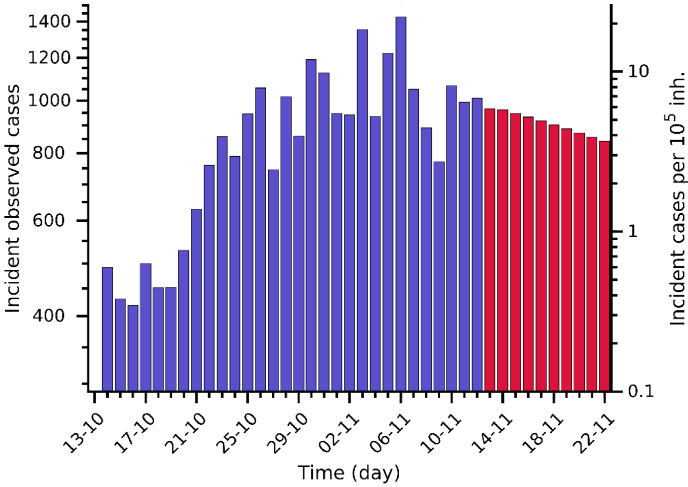
Day	Number of cases	95% Confidence Interval
15-11-2020	61838 (+2875)	[61214 - 62463]
19-11-2020	65479 (+6516)	[64519 - 66439]
22-11-2020	68049 (+9086)	[66542 - 69556]

Current indicators

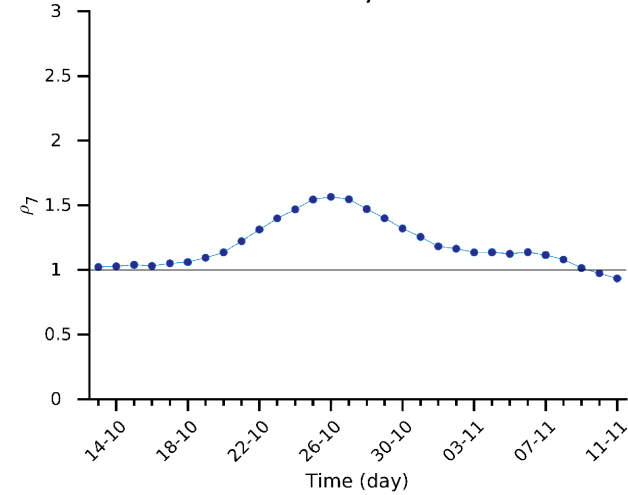
	A14	EPG	CFR	N7	D7
Today	258	241	0.59 %	1030	3
A Week ago	242	274	0.69 %	1103	2
Maximum	258	324	4.41 %	1136	16



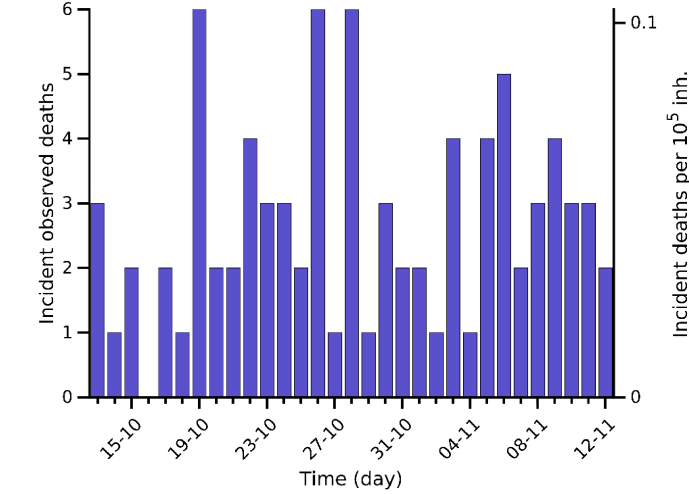
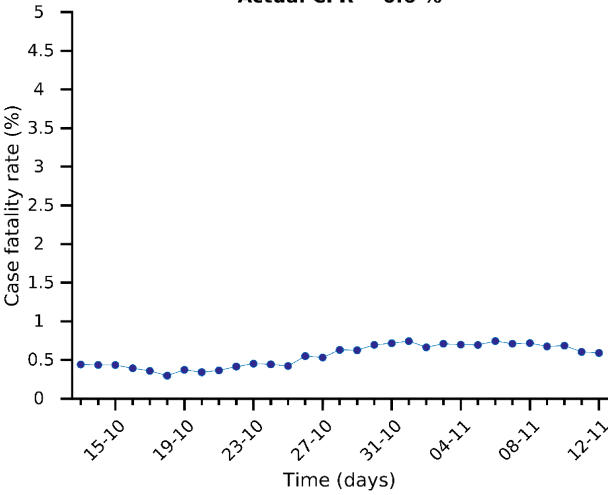
BIOCOM-Cov2 Degree = 9



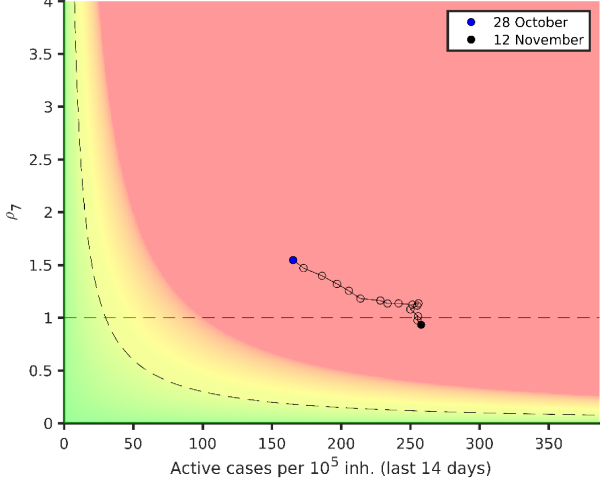
Actual $\rho_7 = 0.9$



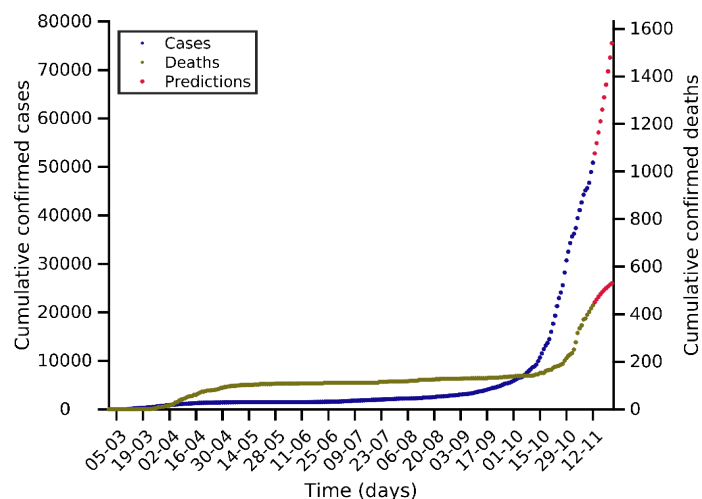
Actual CFR = 0.6 %



Risk diagram (last 15 days)



Slovenia 12-11-2020. Pop: 2.1M. Cumulative incidence: 2447/10⁵

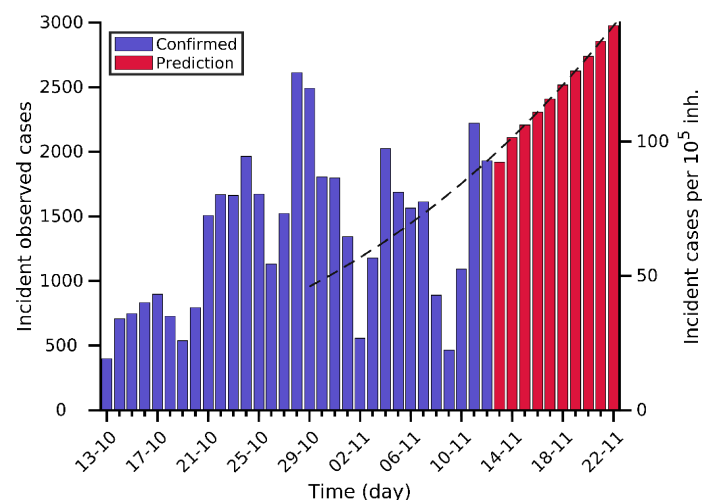


Predictions for next days

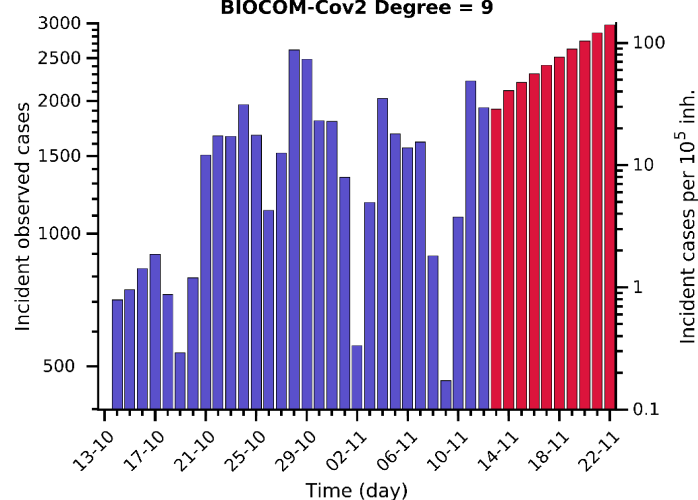
Day	Number of cases	95% Confidence Interval
15-11-2020	57106 (+6236)	[50870 - 64071]
19-11-2020	66965 (+16095)	[50870 - 87755]
22-11-2020	75536 (+24666)	[50870 - 120903]

Current indicators

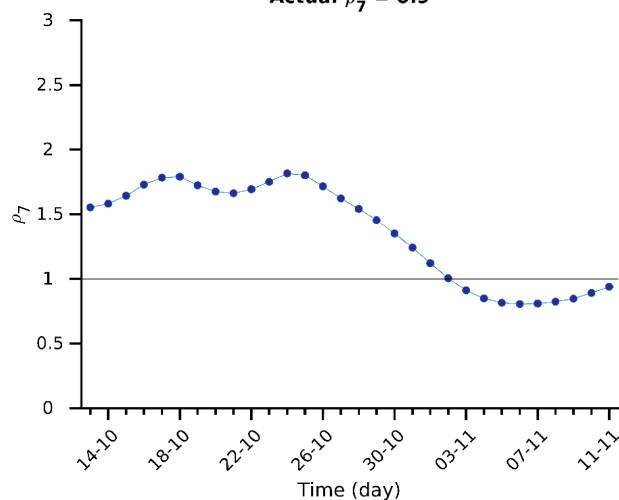
	A14	EPG	CFR	N7	D7
Today	970	911	2.19 %	1397	14
A Week ago	1128	958	3.47 %	1484	18
Maximum	1128	1484	4.97 %	1885	21



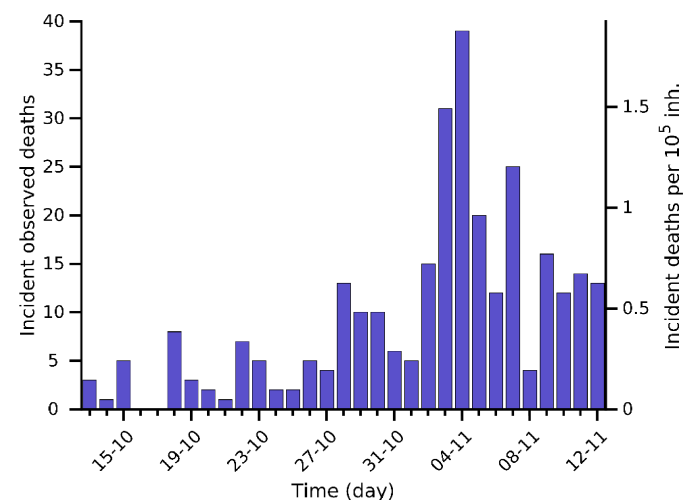
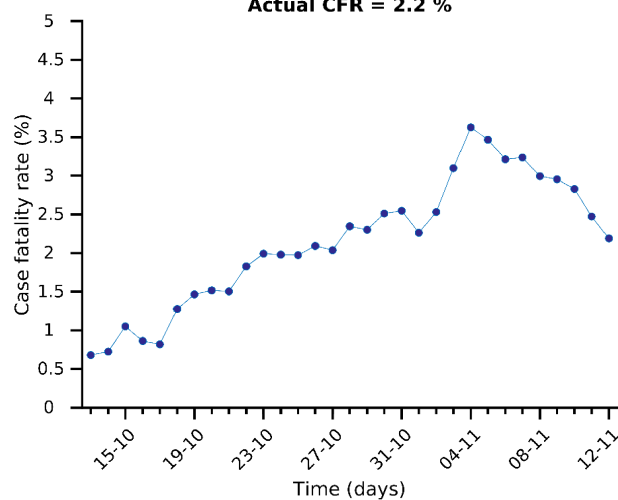
BIOCOM-Cov2 Degree = 9



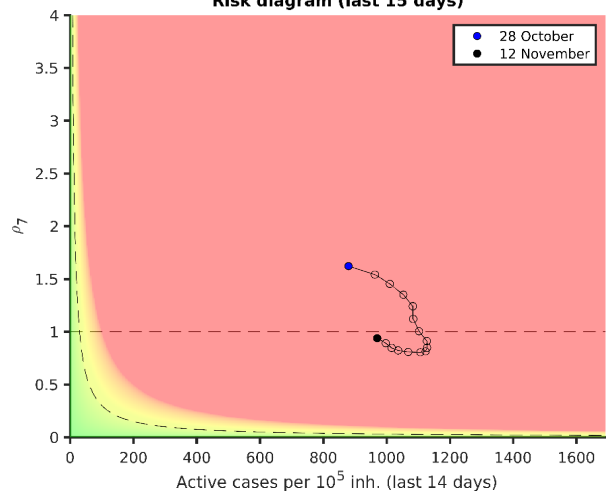
Actual $\rho_7 = 0.9$



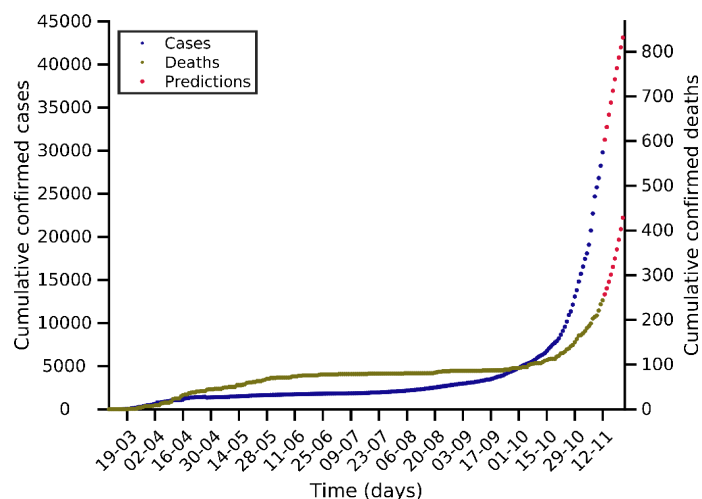
Actual CFR = 2.2 %



Risk diagram (last 15 days)



Lithuania 12-11-2020. Pop: 2.7M. Cumulative incidence: 1095/10⁵

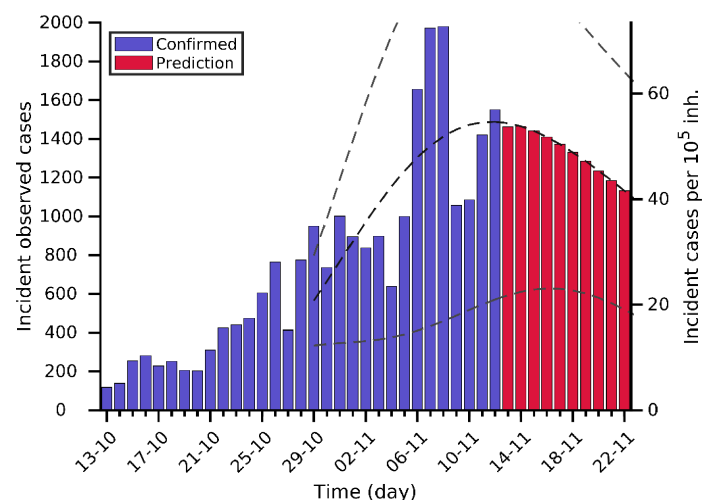


Predictions for next days

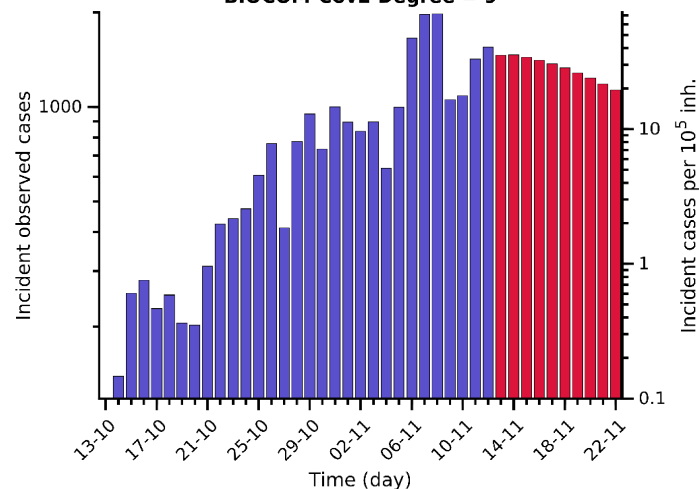
Day	Number of cases	95% Confidence Interval
15-11-2020	34181 (+4369)	[32648 - 35713]
19-11-2020	39577 (+9765)	[36720 - 42434]
22-11-2020	43129 (+13317)	[38507 - 47751]

Current indicators

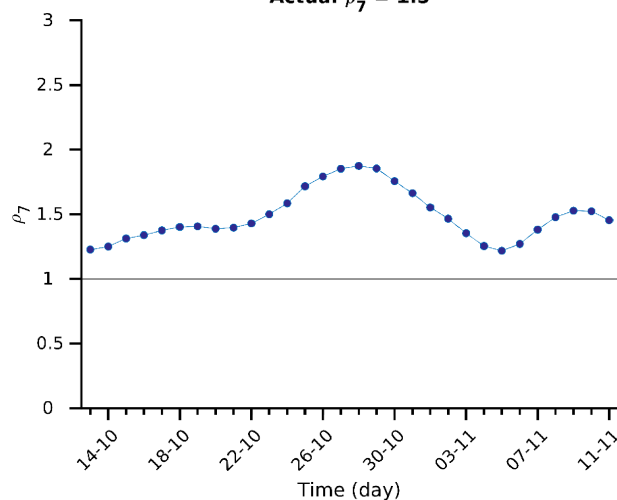
	A14	EPG	CFR	N7	D7
Today	614	893	3.09 %	1532	8
A Week ago	383	480	3.09 %	858	5
Maximum	614	902	4.93 %	1532	8



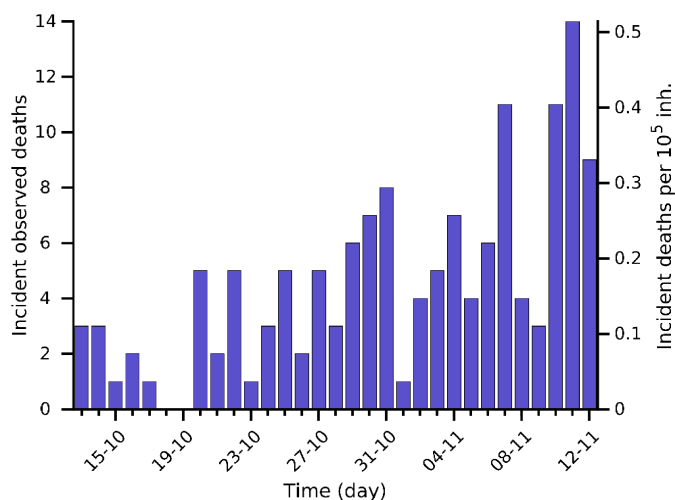
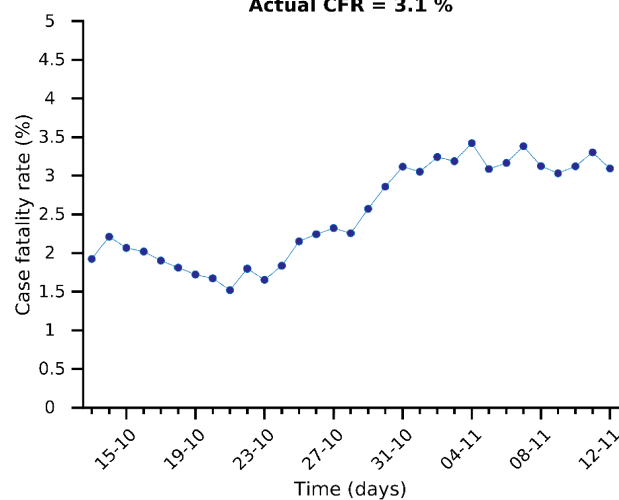
BIOCOM-Cov2 Degree = 9



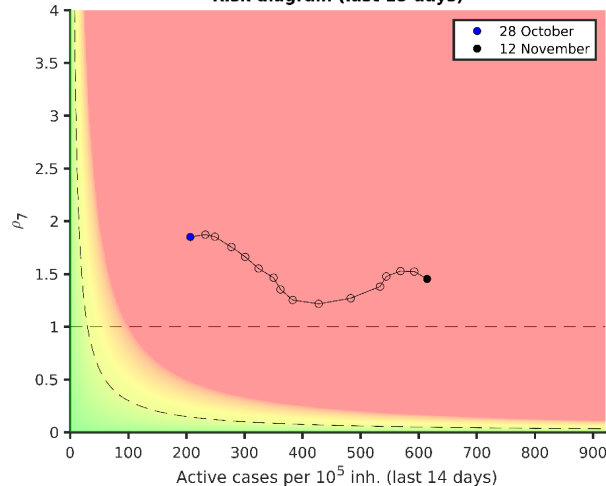
Actual $\rho_7 = 1.5$



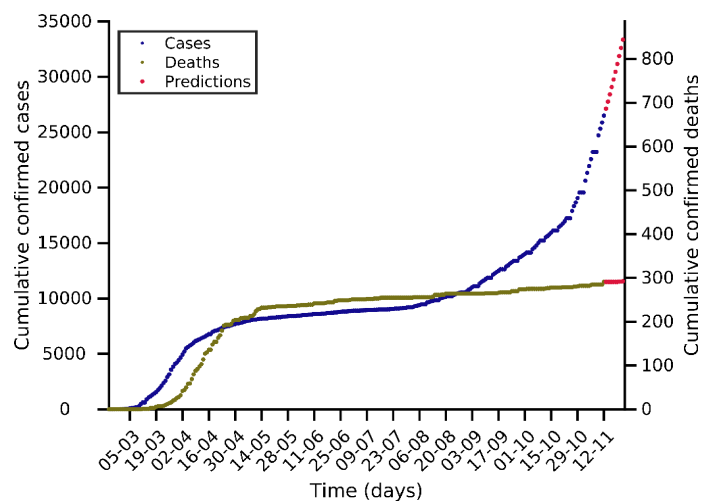
Actual CFR = 3.1 %



Risk diagram (last 15 days)



Norway 12-11-2020. Pop: 5.4M. Cumulative incidence: 489/10⁵

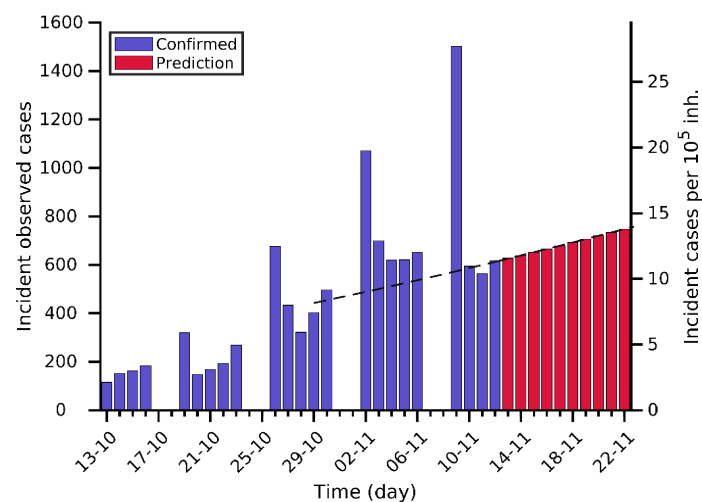


Predictions for next days

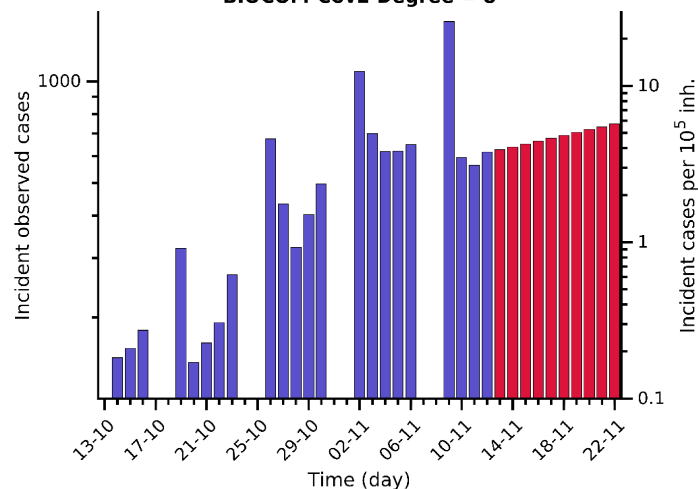
Day	Number of cases	95% Confidence Interval
15-11-2020	28421 (+1918)	[26841 - 30000]
19-11-2020	31163 (+4660)	[27168 - 35158]
22-11-2020	33364 (+6861)	[26503 - 41440]

Current indicators

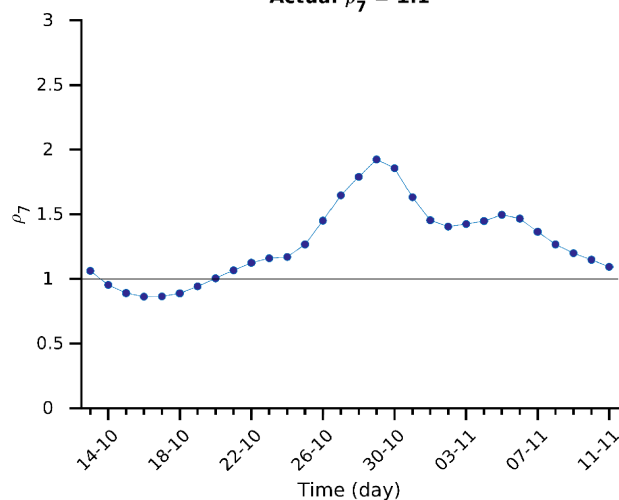
	A14	EPG	CFR	N7	D7
Today	137	150	0.51 %	561	1
A Week ago	104	150	0.26 %	501	0
Maximum	137	165	4.97 %	585	8



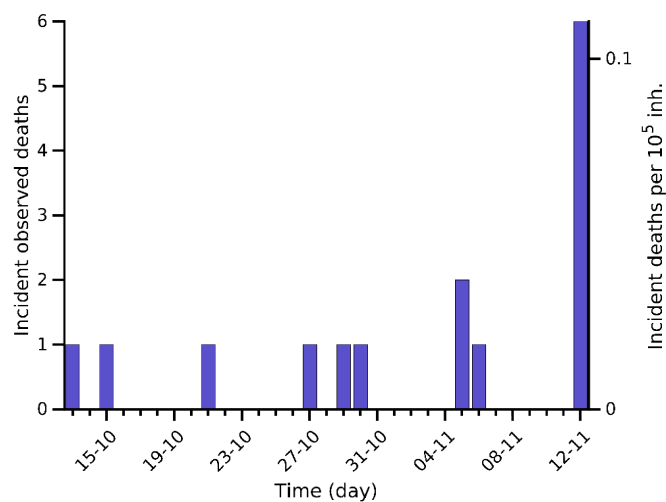
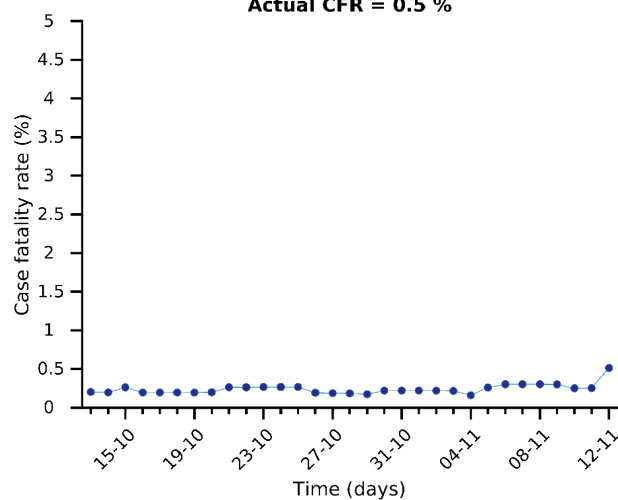
BIOCOM-Cov2 Degree = 8



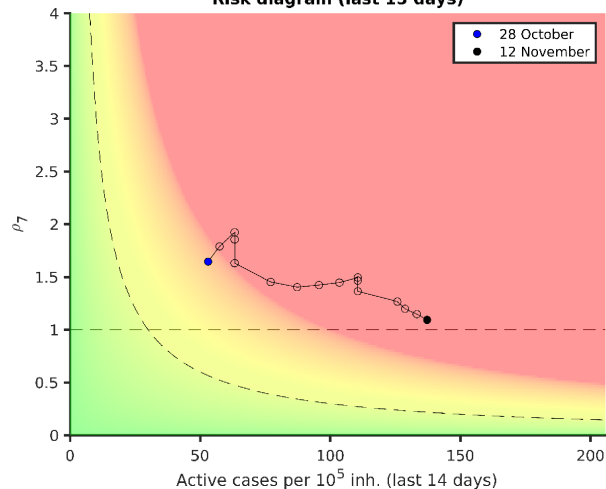
Actual $\rho_7 = 1.1$



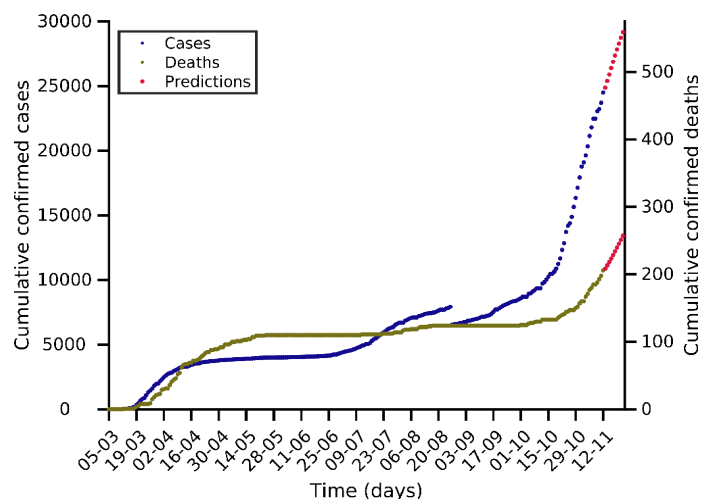
Actual CFR = 0.5 %



Risk diagram (last 15 days)



Luxembourg 12-11-2020. Pop: 0.6M. Cumulative incidence: 3915/10⁵

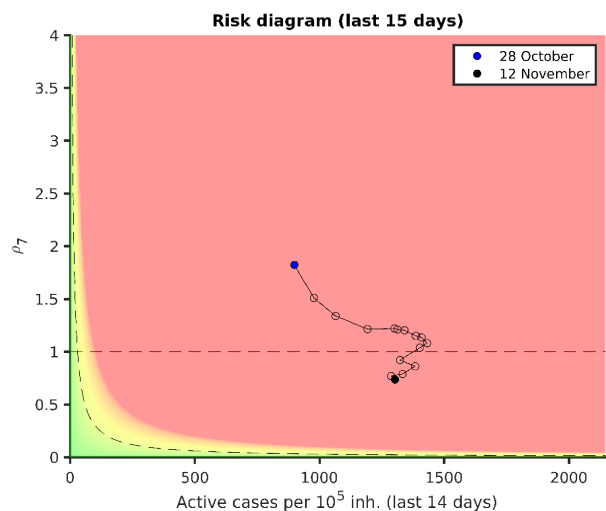
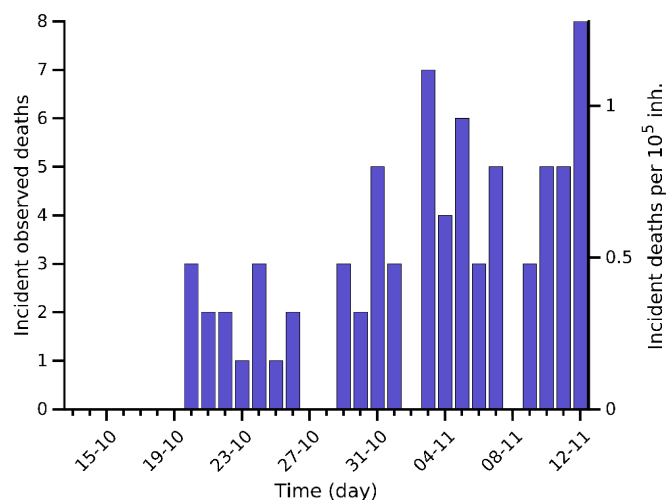
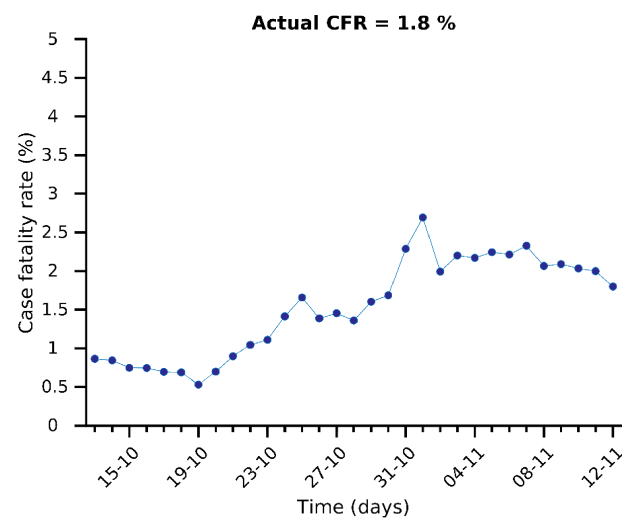
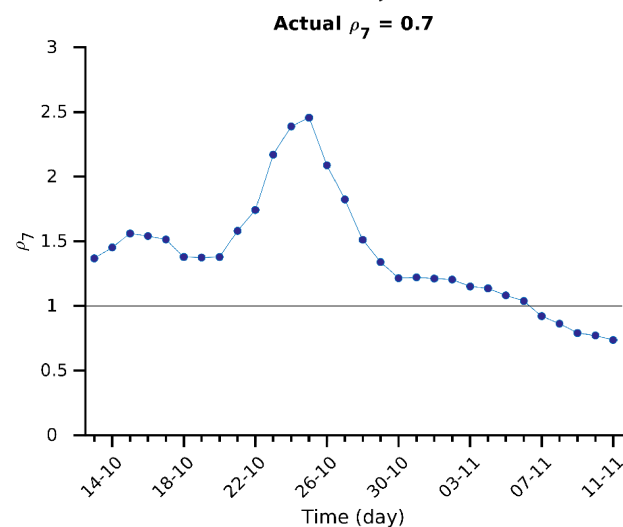
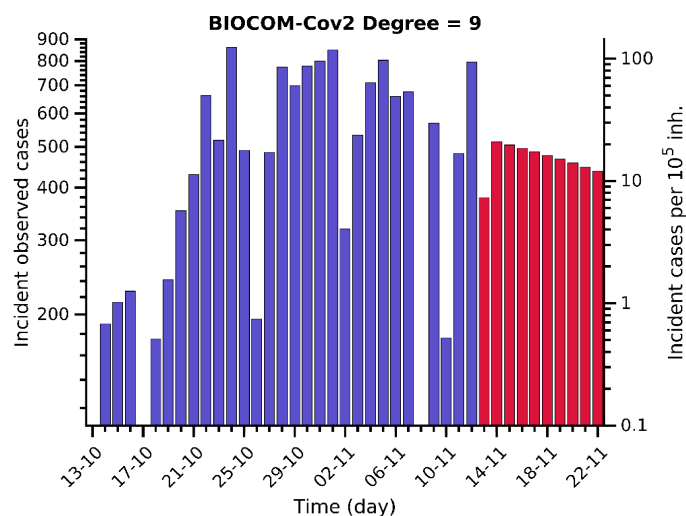
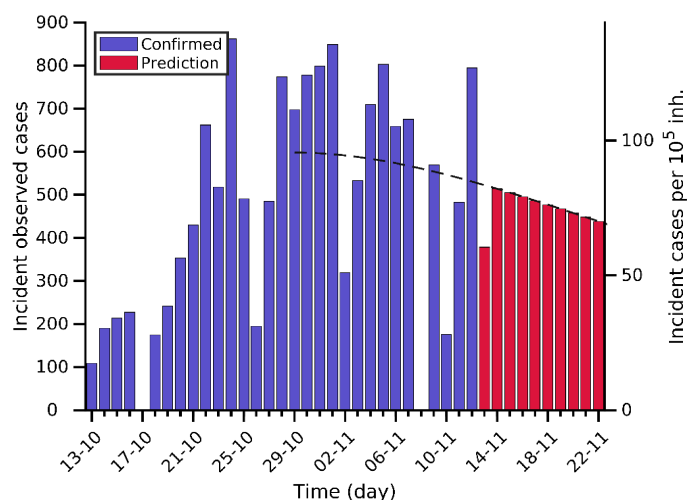


Predictions for next days

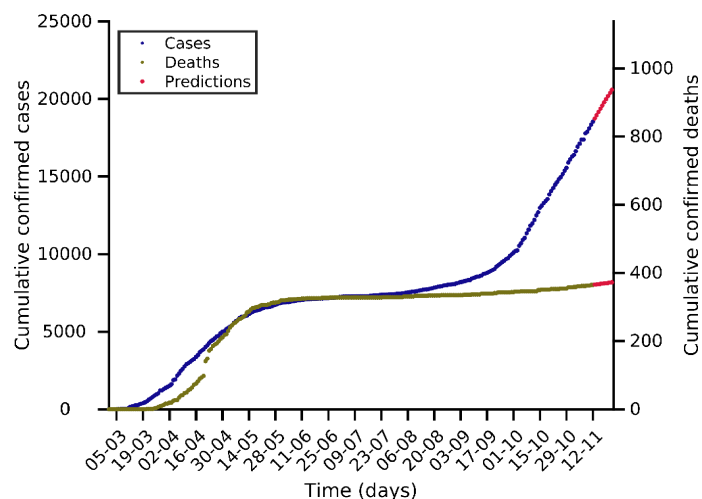
Day	Number of cases	95% Confidence Interval
15-11-2020	25903 (+1398)	[24505 - 28816]
19-11-2020	27830 (+3325)	[24900 - 30760]
22-11-2020	29175 (+4670)	[24505 - 35144]

Current indicators

	A14	EPG	CFR	N7	D7
Today	1302	959	1.80 %	480	4
A Week ago	1408	1599	2.24 %	684	4
Maximum	1431	1848	4.03 %	684	4



Finland 12-11-2020. Pop: 5.5M. Cumulative incidence: 335/10⁵

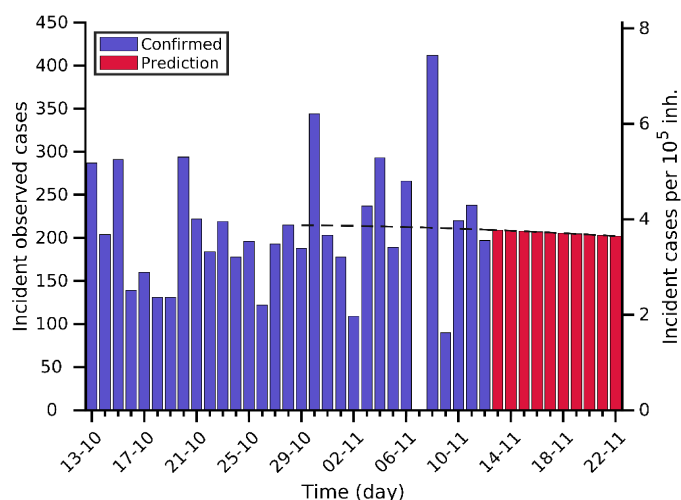


Predictions for next days

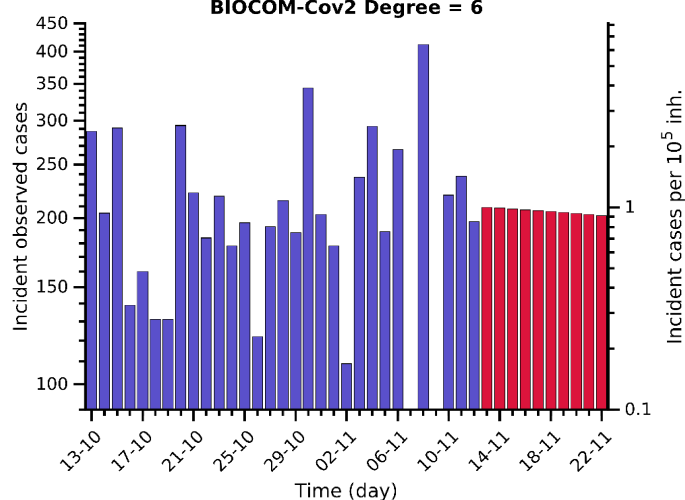
Day	Number of cases	95% Confidence Interval
15-11-2020	19167 (+625)	[18542 - 22032]
19-11-2020	19990 (+1448)	[18542 - 25652]
22-11-2020	20599 (+2057)	[18542 - 29390]

Current indicators

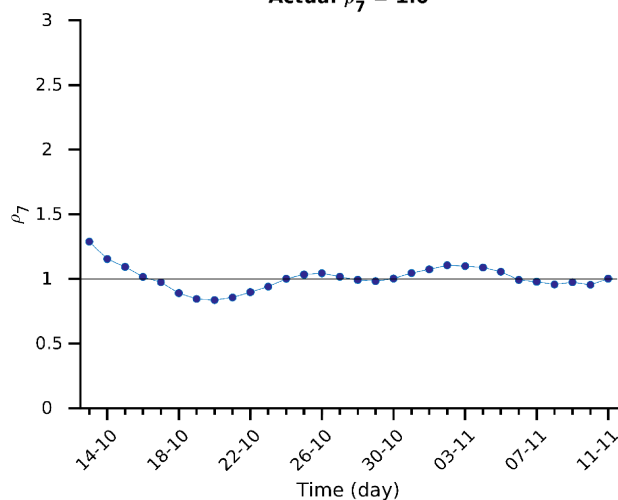
	A14	EPG	CFR	N7	D7
Today	54	54	0.38 %	203	1
A Week ago	52	56	0.28 %	222	1
Maximum	55	70	4.90 %	236	14



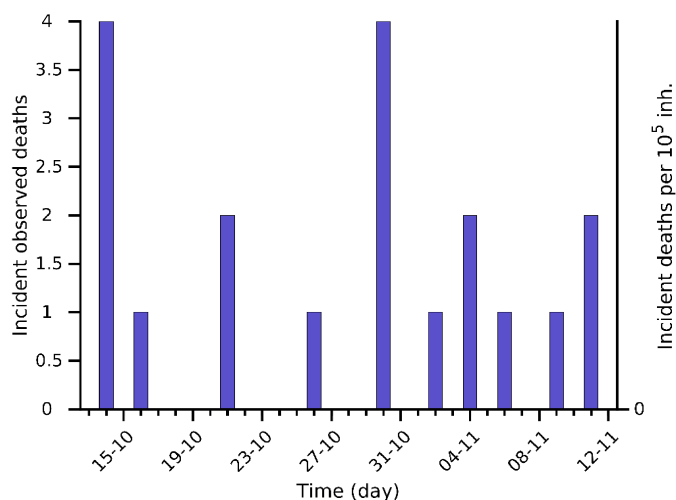
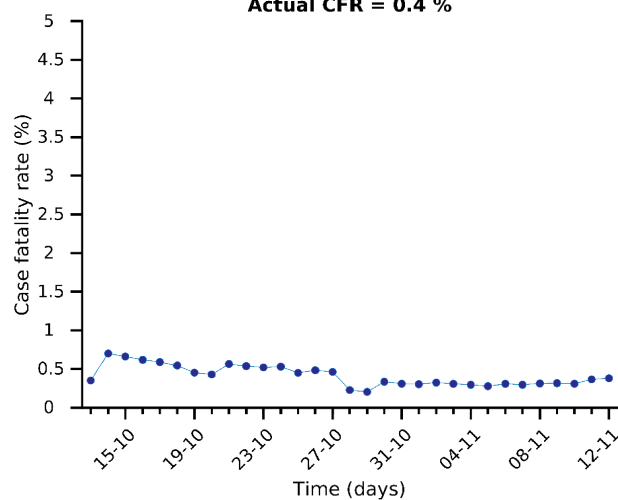
BIOCOM-Cov2 Degree = 6



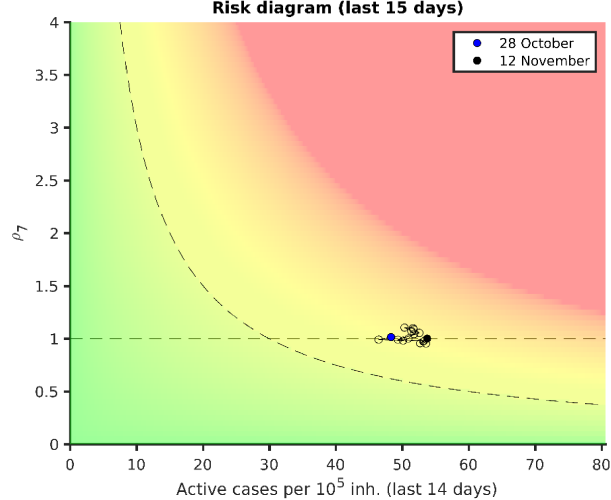
Actual $\rho_7 = 1.0$



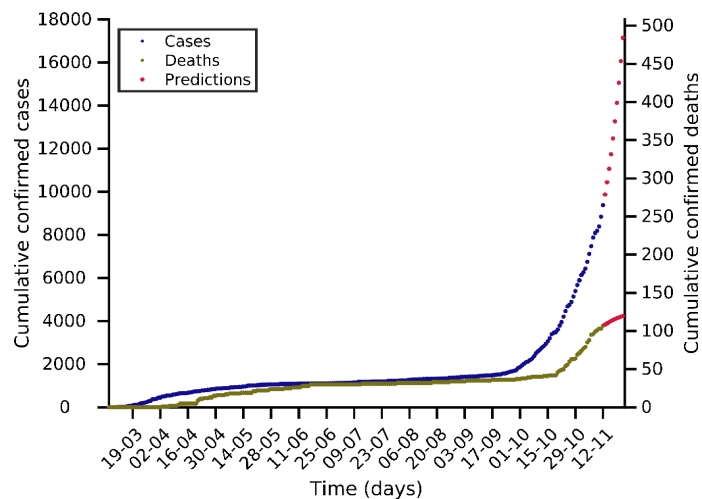
Actual CFR = 0.4 %



Risk diagram (last 15 days)



Latvia 12-11-2020. Pop: 1.9M. Cumulative incidence: 497/10⁵

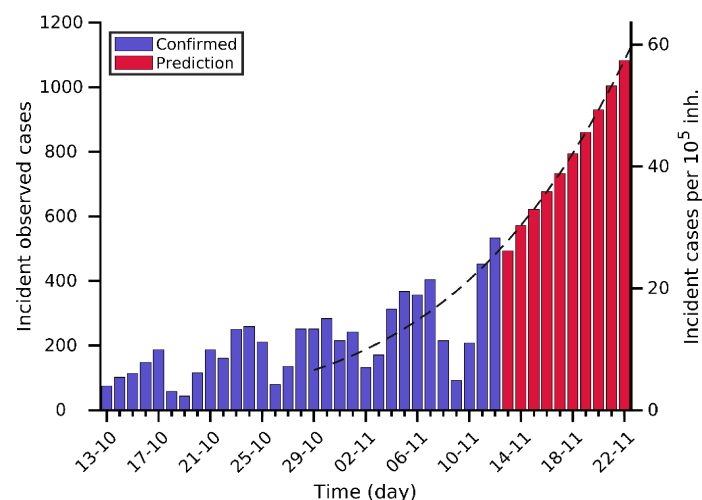


Predictions for next days

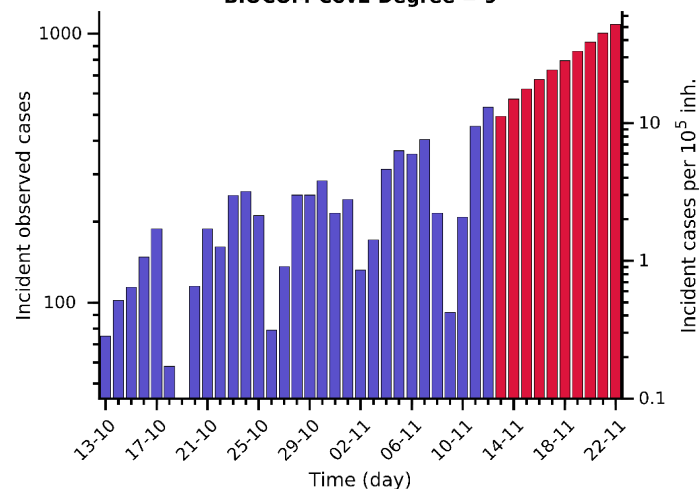
Day	Number of cases	95% Confidence Interval
15-11-2020	11069 (+1688)	[9586 - 12551]
19-11-2020	14133 (+4752)	[9381 - 19964]
22-11-2020	17150 (+7769)	[9381 - 31393]

Current indicators

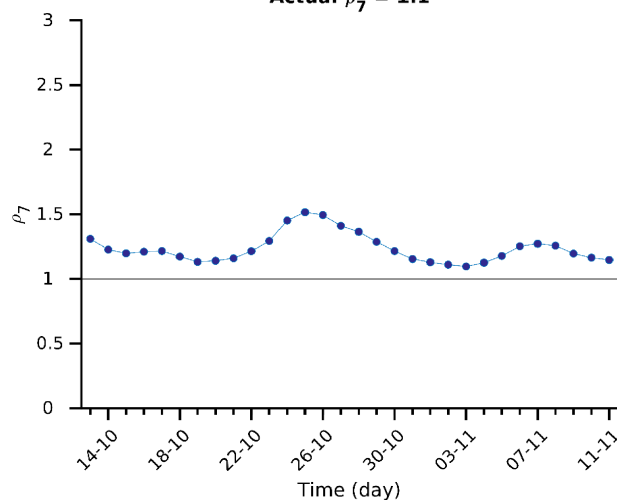
	A14	EPG	CFR	N7	D7
Today	211	242	2.71 %	323	3
A Week ago	168	189	3.28 %	246	3
Maximum	211	242	4.88 %	323	4



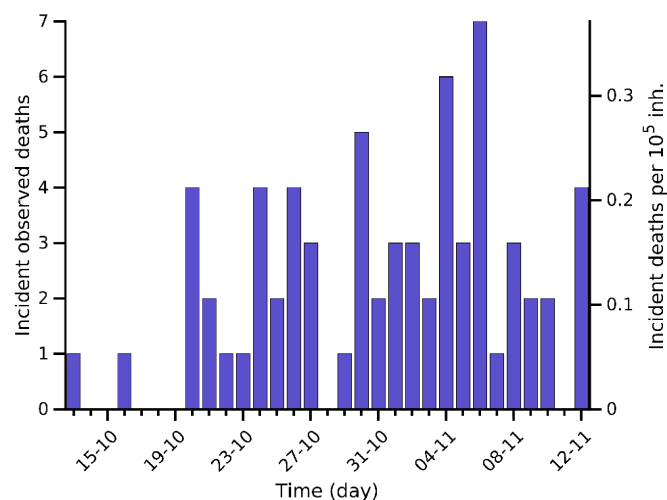
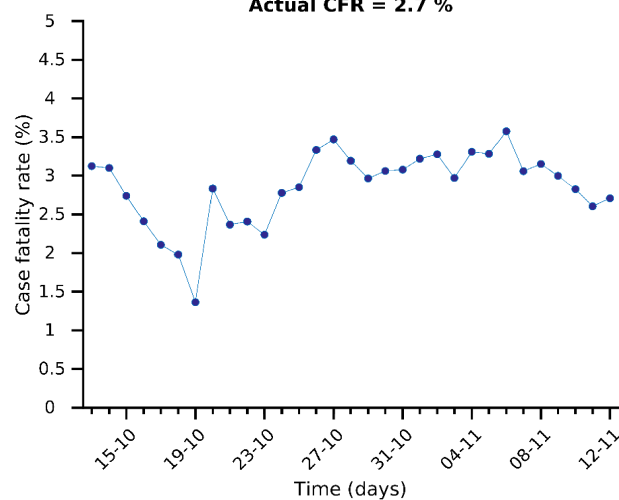
BIOCOM-Cov2 Degree = 9



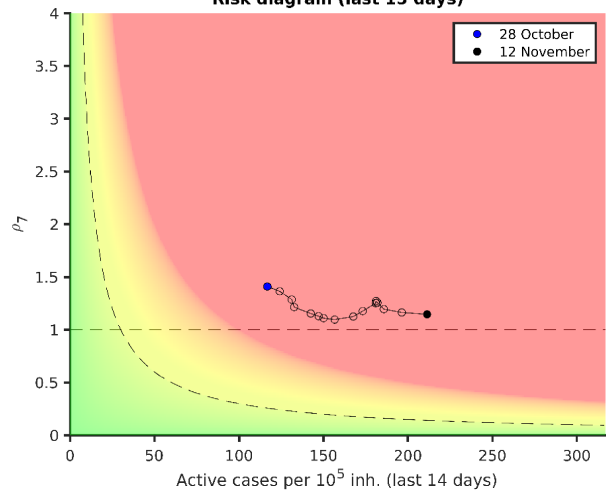
Actual $\rho_7 = 1.1$



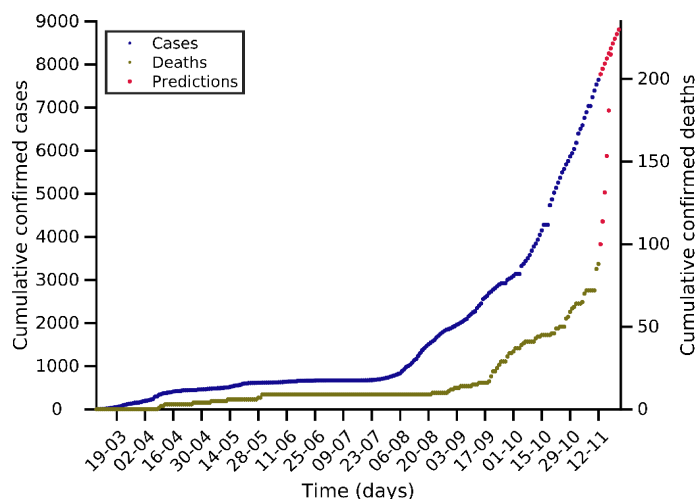
Actual CFR = 2.7 %



Risk diagram (last 15 days)



Malta 12-11-2020. Pop: 0.4M. Cumulative incidence: 1732/10⁵

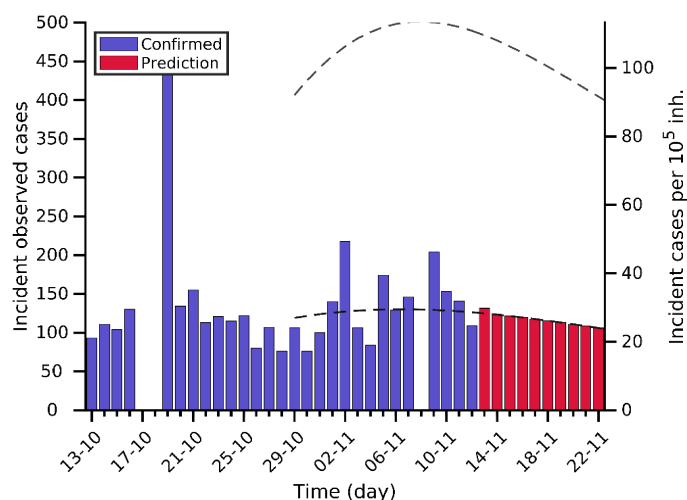


Predictions for next days

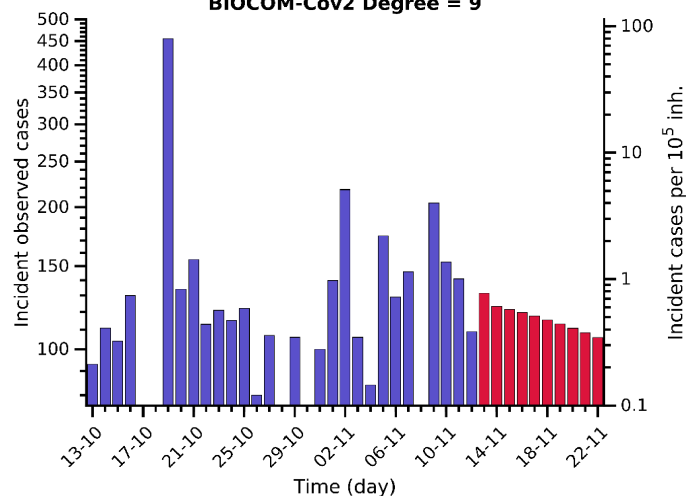
Day	Number of cases	95% Confidence Interval
15-11-2020	8022 (+376)	[7818 - 8227]
19-11-2020	8488 (+842)	[8102 - 8873]
22-11-2020	8813 (+1167)	[8160 - 9466]

Current indicators

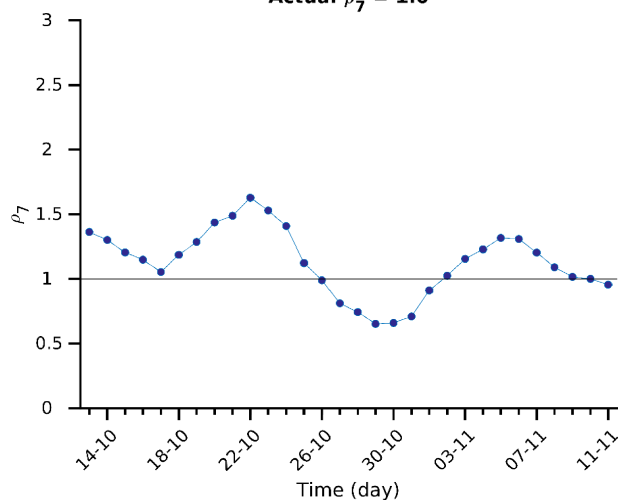
	A14	EPG	CFR	N7	D7
Today	403	385	1.78 %	126	3
A Week ago	368	452	1.99 %	128	2
Maximum	430	619	4.92 %	174	3



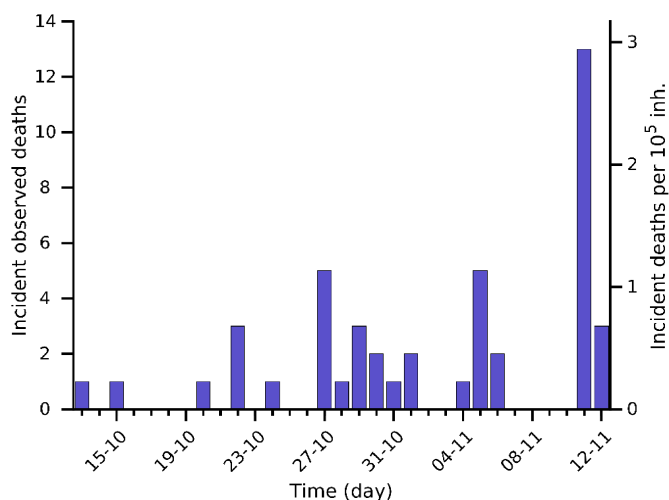
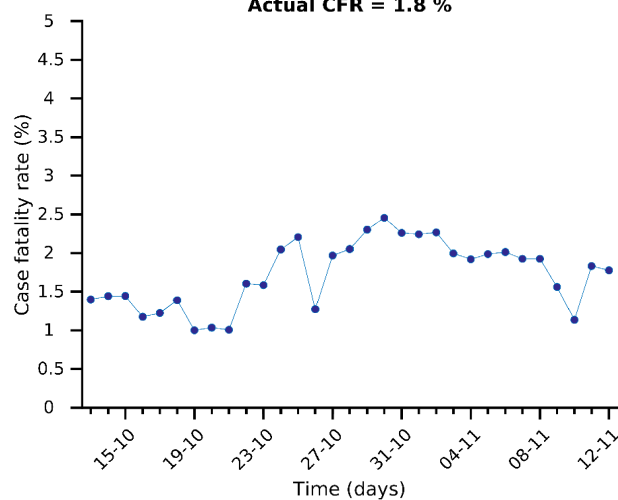
BIOCOM-Cov2 Degree = 9



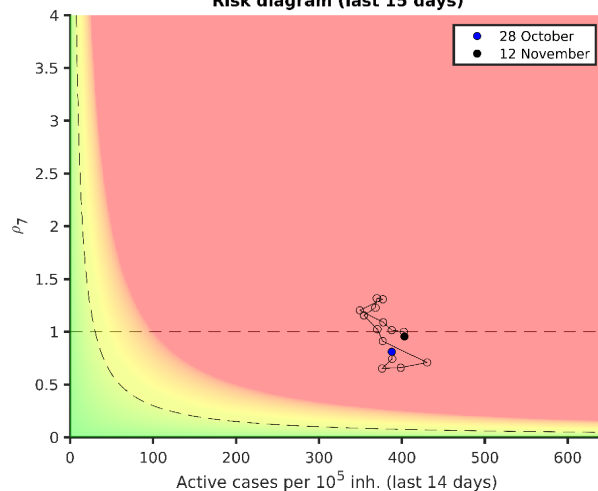
Actual $\rho_7 = 1.0$



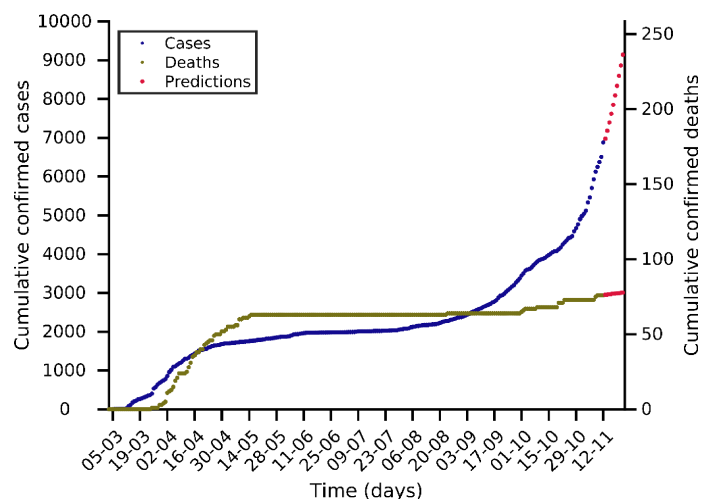
Actual CFR = 1.8 %



Risk diagram (last 15 days)



Estonia 12-11-2020. Pop: 1.3M. Cumulative incidence: 519/10⁵

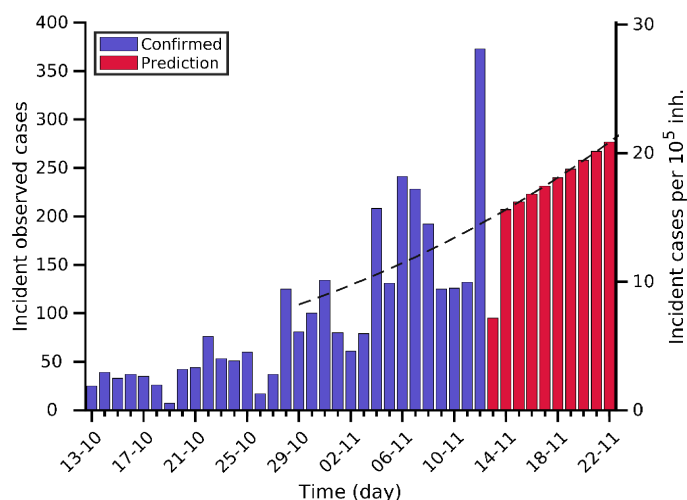


Predictions for next days

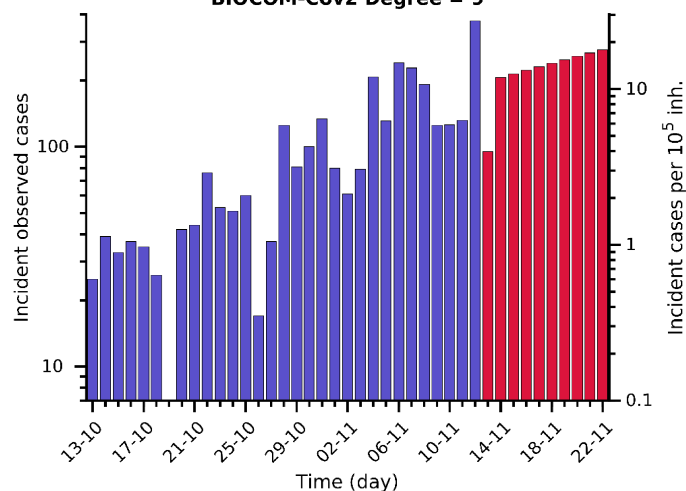
Day	Number of cases	95% Confidence Interval
15-11-2020	7398 (+517)	[6881 - 8881]
19-11-2020	8341 (+1460)	[6881 - 12571]
22-11-2020	9143 (+2262)	[6881 - 18204]

Current indicators

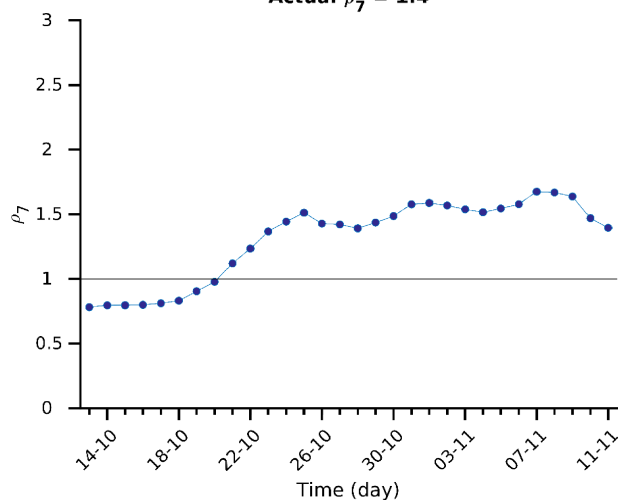
	A14	EPG	CFR	N7	D7
Today	167	232	0.62 %	202	0
A Week ago	92	139	0.38 %	113	0
Maximum	167	236	4.92 %	202	3



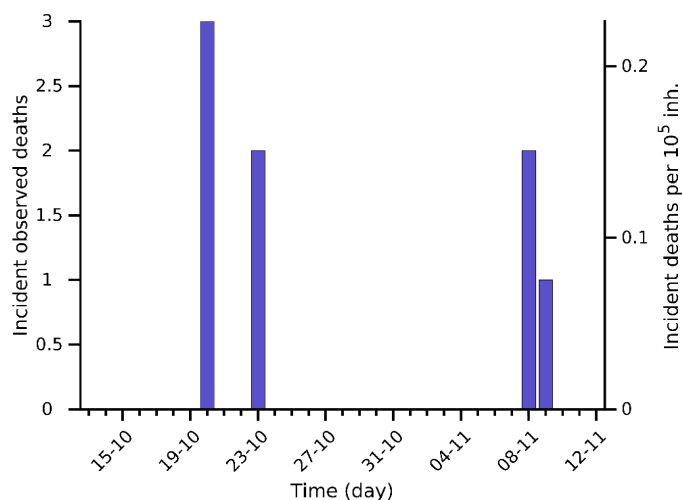
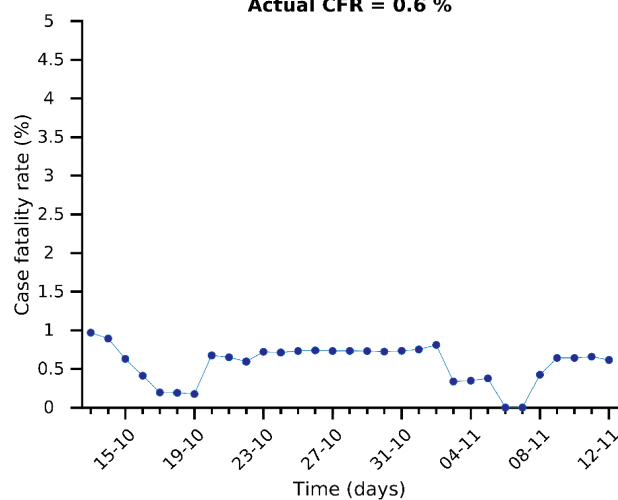
BIOCOM-Cov2 Degree = 9



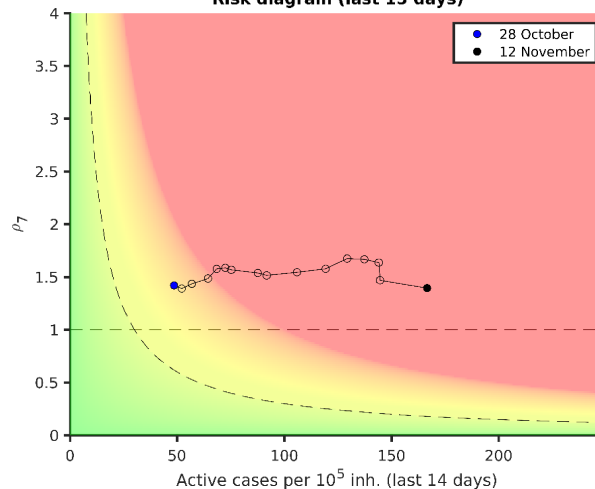
Actual $\rho_7 = 1.4$



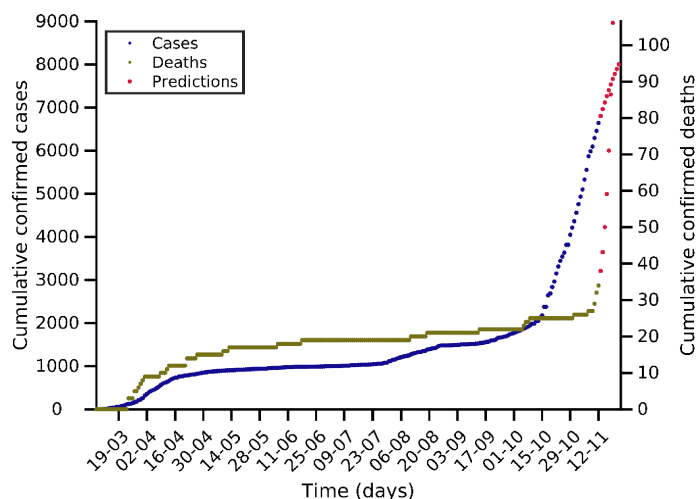
Actual CFR = 0.6 %



Risk diagram (last 15 days)



Cyprus 12-11-2020. Pop: 1.2M. Cumulative incidence: 550/10⁵

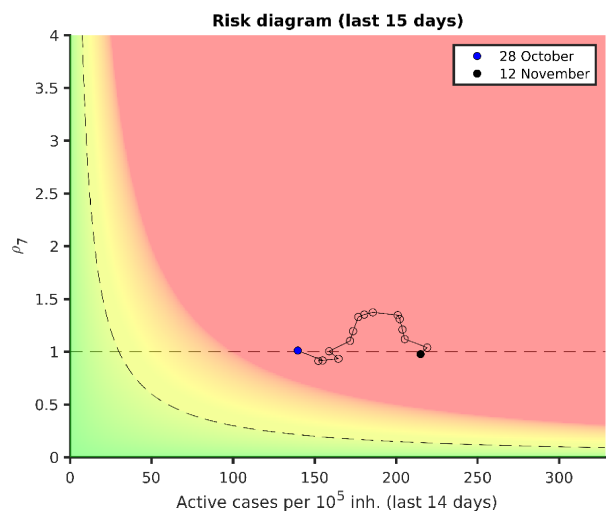
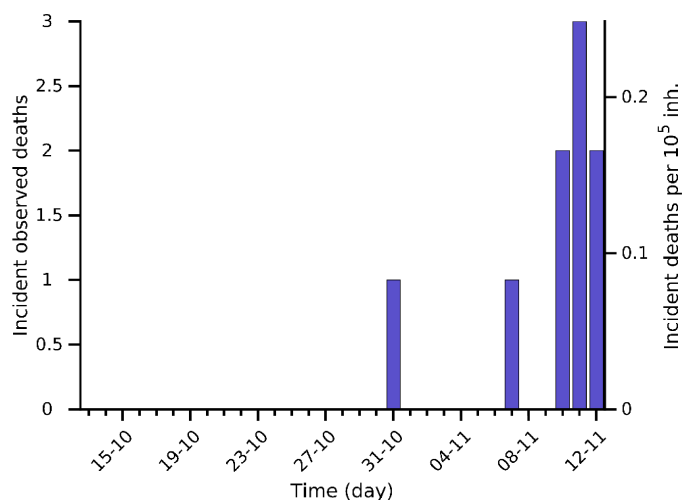
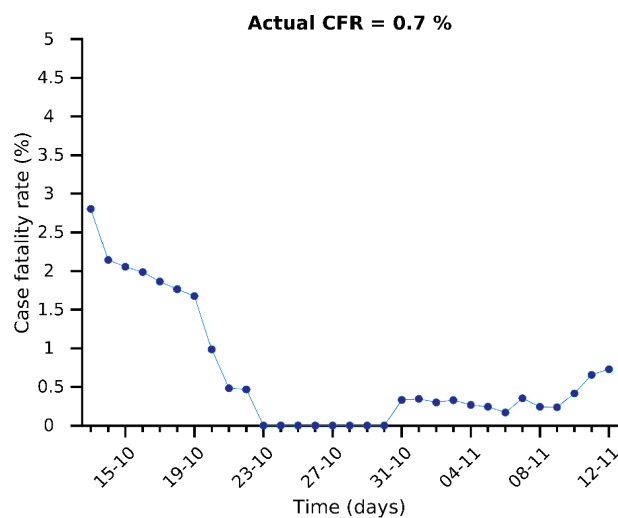
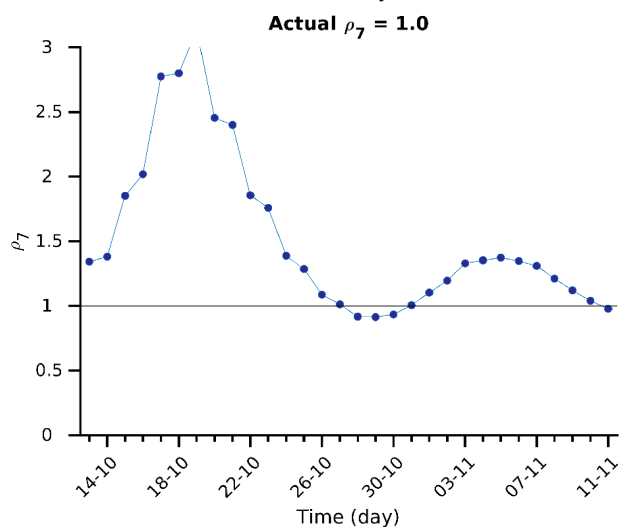
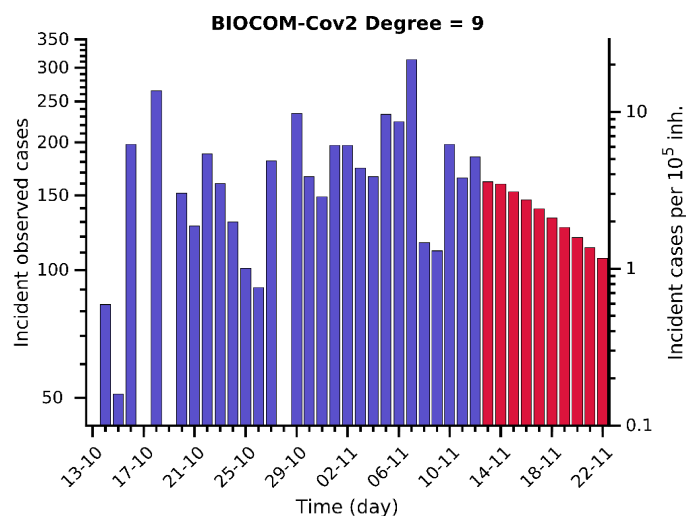
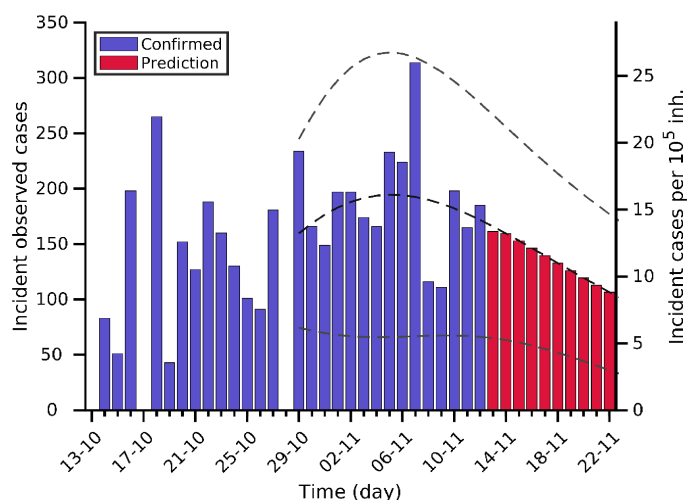


Predictions for next days

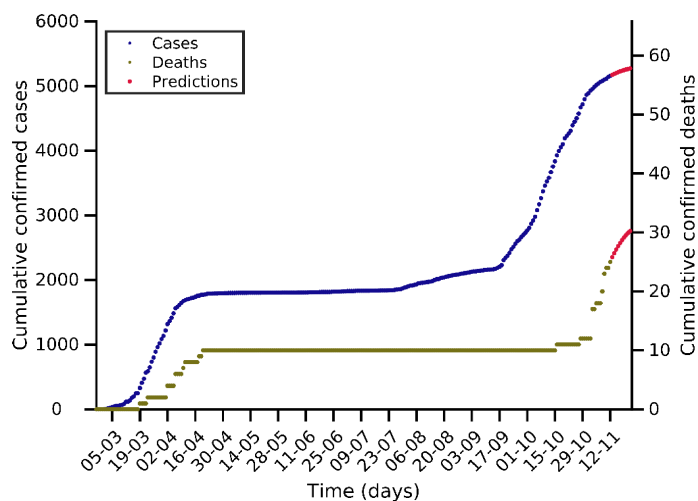
Day	Number of cases	95% Confidence Interval
15-11-2020	7120 (+474)	[6927 - 7313]
19-11-2020	7665 (+1019)	[7358 - 7971]
22-11-2020	8004 (+1358)	[7548 - 8459]

Current indicators

	A14	EPG	CFR	N7	D7
Today	215	210	0.73 %	188	1
A Week ago	180	244	0.24 %	183	0
Maximum	219	271	4.48 %	215	1



Iceland 12-11-2020. Pop: 0.3M. Cumulative incidence: 1512/10⁵

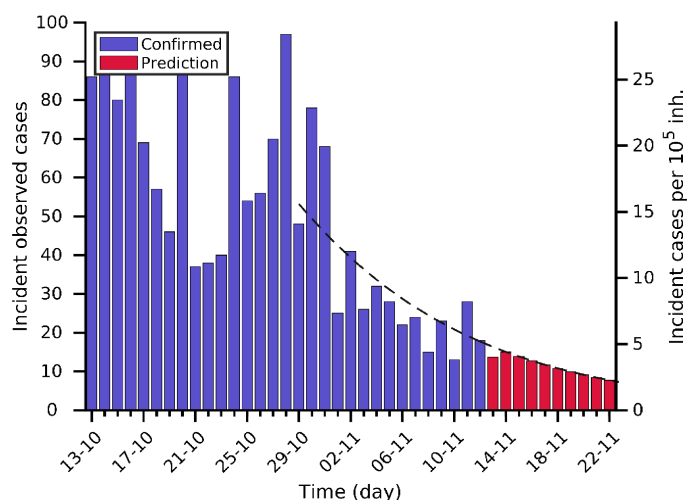


Predictions for next days

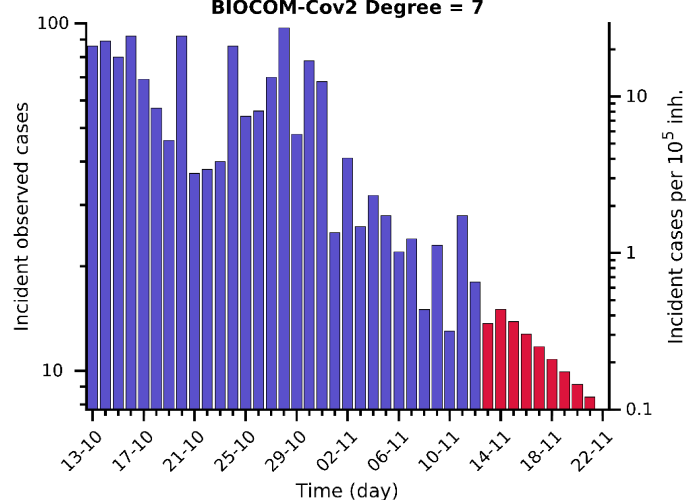
Day	Number of cases	95% Confidence Interval
15-11-2020	5203 (+43)	[5160 - 8209]
19-11-2020	5248 (+88)	[5160 - 11887]
22-11-2020	5273 (+113)	[5160 - 11824]

Current indicators

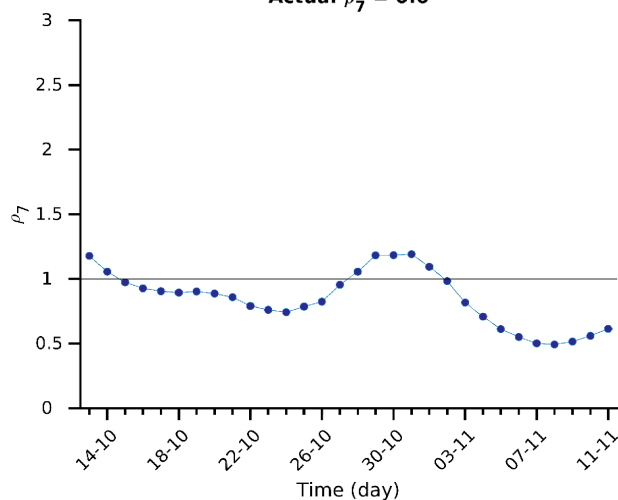
	A14	EPG	CFR	N7	D7
Today	129	79	1.30 %	20	1
A Week ago	219	155	0.66 %	43	1
Maximum	332	469	4.65 %	86	2



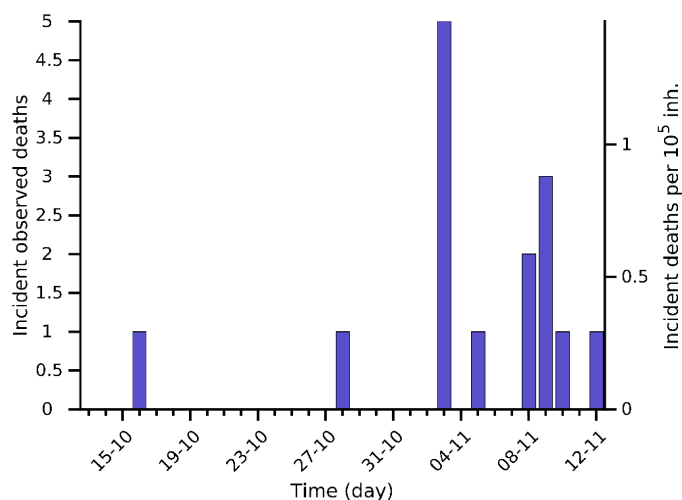
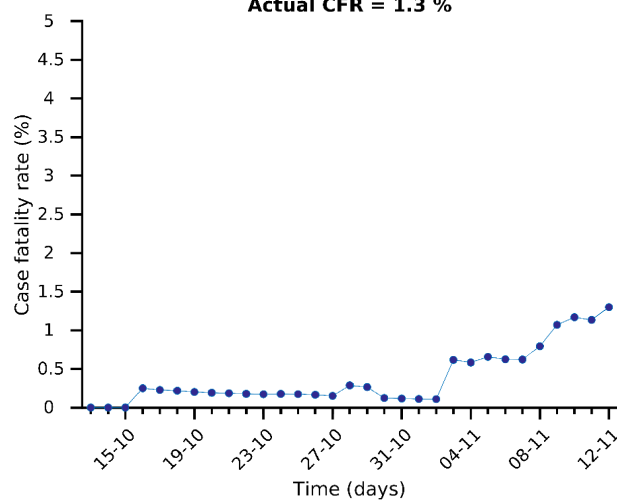
BIOCOM-Cov2 Degree = 7



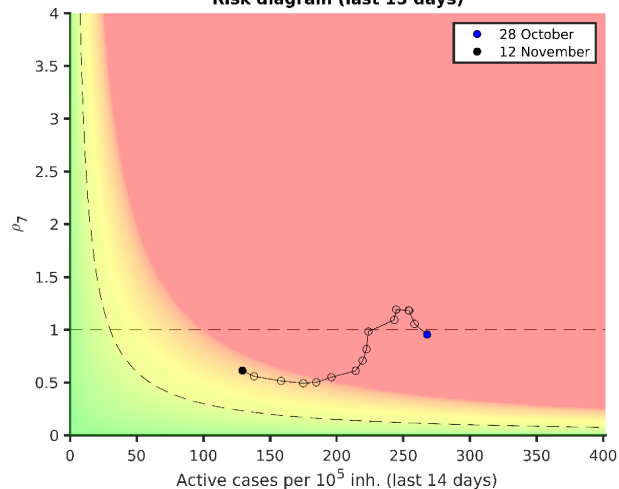
Actual $\rho_7 = 0.6$



Actual CFR = 1.3 %

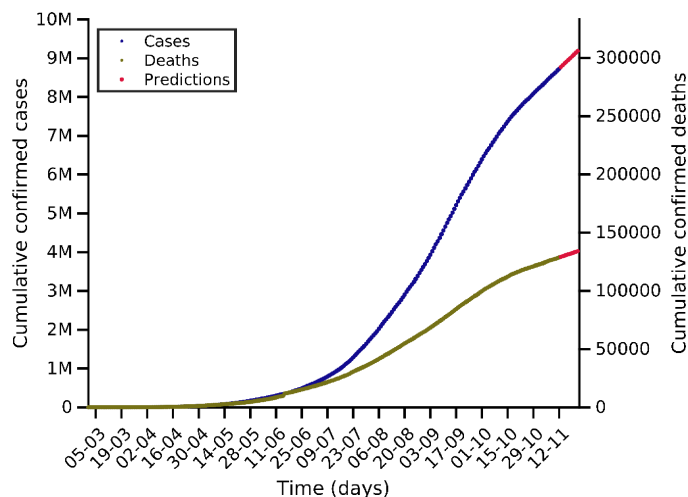


Risk diagram (last 15 days)



(2) Analysis and prediction of COVID-19 for other countries

India 12-11-2020. Pop: 1353.0M. Cumulative incidence: 645/10⁵

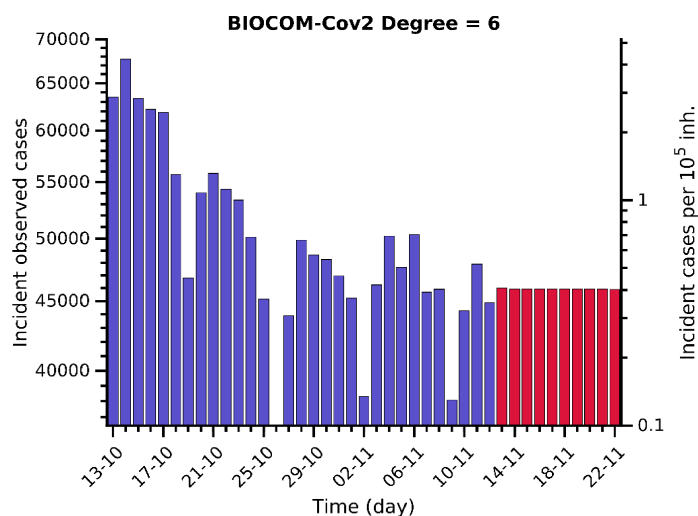
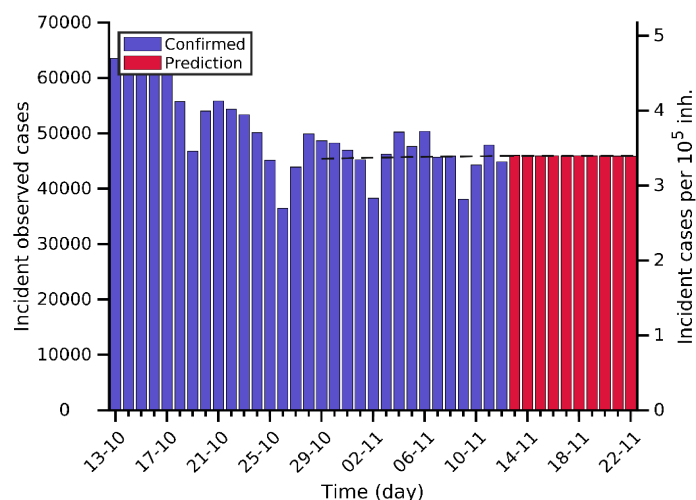


Predictions for next days

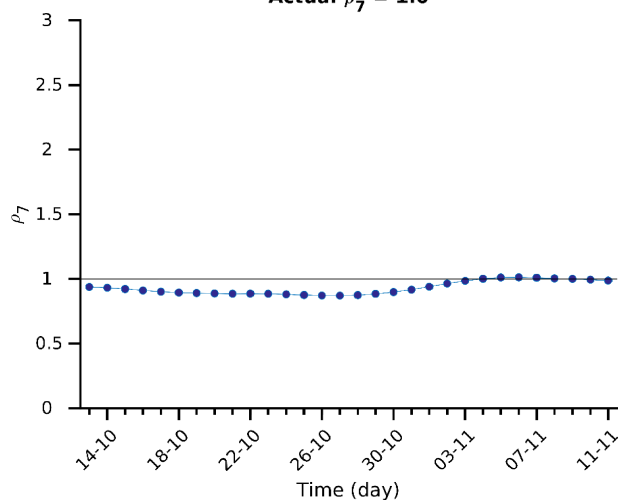
Day	Number of cases	95% Confidence Interval
15-11-2020	8866653 (+137858)	[8843718 - 8889589]
19-11-2020	9050378 (+321583)	[8999489 - 9101267]
22-11-2020	9188103 (+459308)	[9091852 - 9284354]

Current indicators

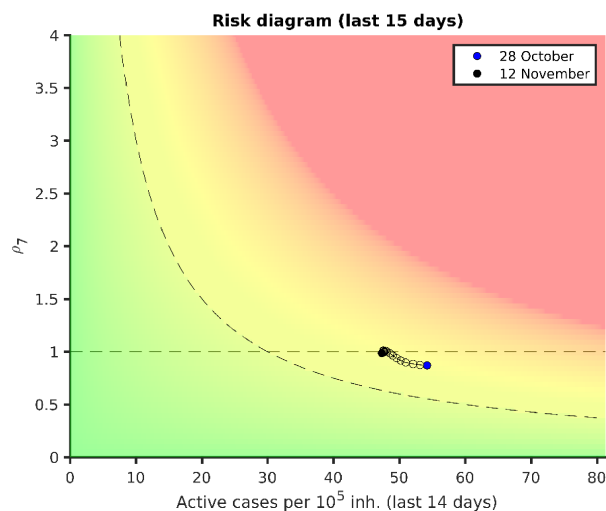
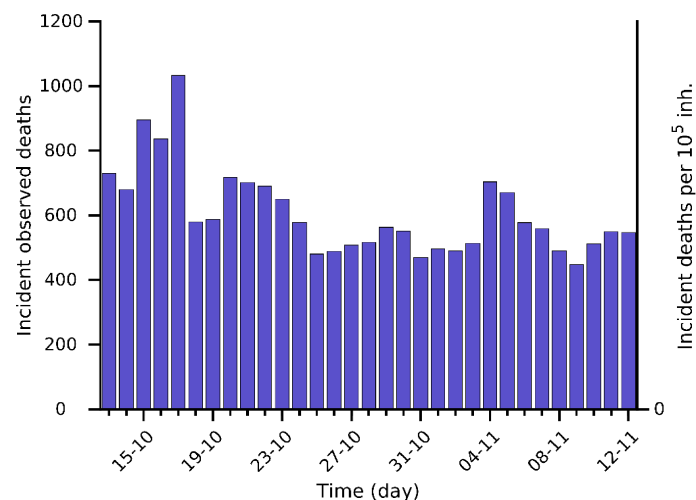
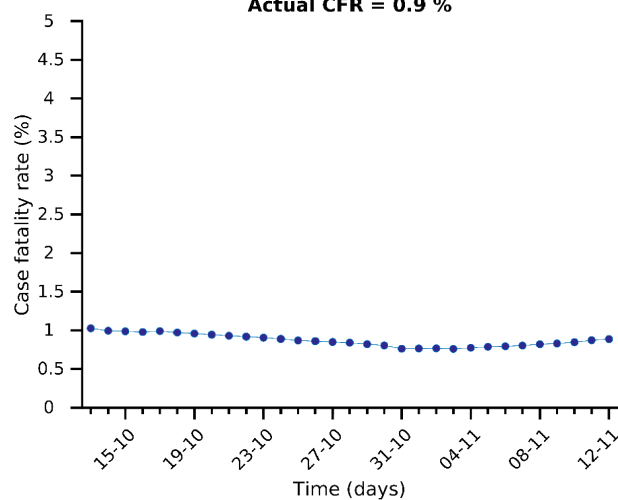
	A14	EPG	CFR	N7	D7
Today	47	47	0.89 %	45296	526
A Week ago	48	48	0.79 %	46125	556
Maximum	95	98	4.40 %	93199	1168



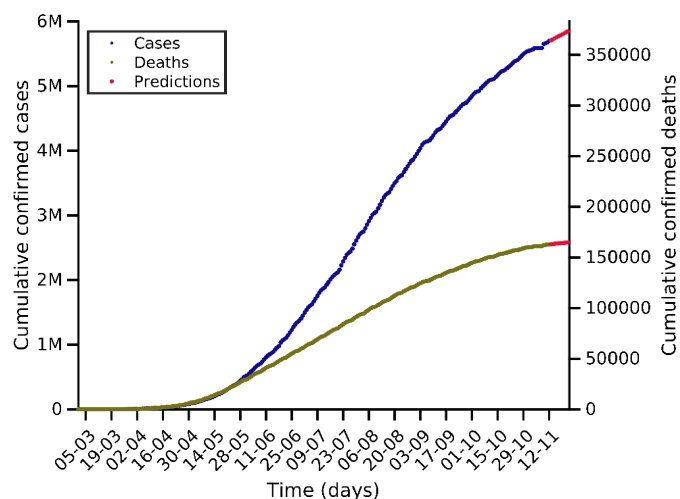
Actual $\rho_7 = 1.0$



Actual CFR = 0.9 %



Brazil 12-11-2020. Pop: 212.6M. Cumulative incidence: 2682/10⁵

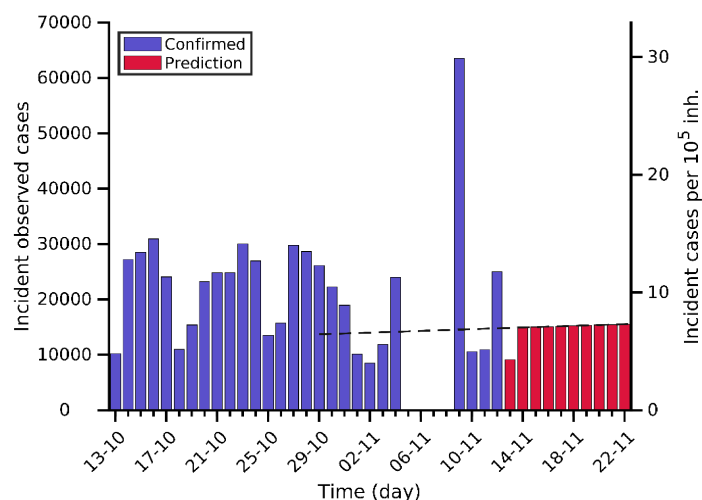


Predictions for next days

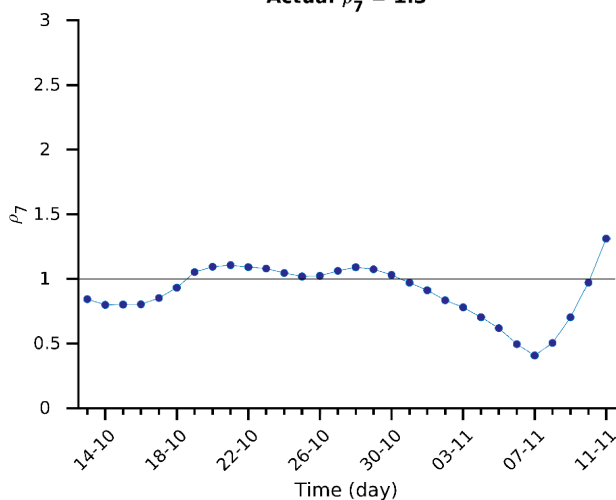
Day	Number of cases	95% Confidence Interval
15-11-2020	5739060 (+39016)	[5700044 - 5839877]
19-11-2020	5799823 (+99779)	[5700044 - 6033572]
22-11-2020	5846185 (+146141)	[5700044 - 6298570]

Current indicators

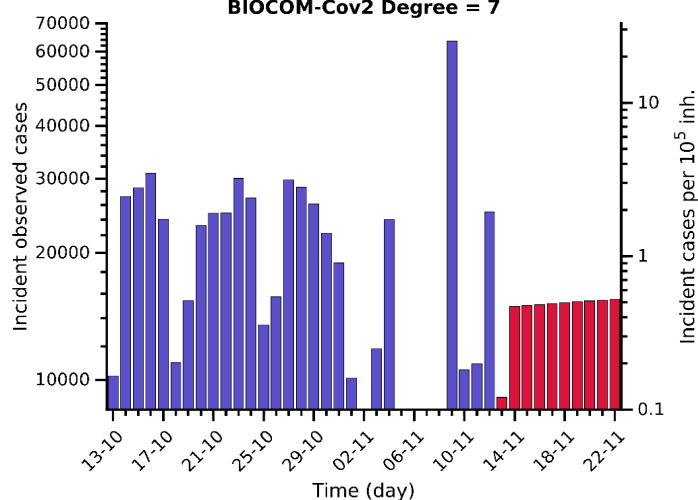
	A14	EPG	CFR	N7	D7
Today	97	127	1.31 %	15717	246
A Week ago	125	88	1.62 %	13664	305
Maximum	302	349	4.84 %	46393	1097



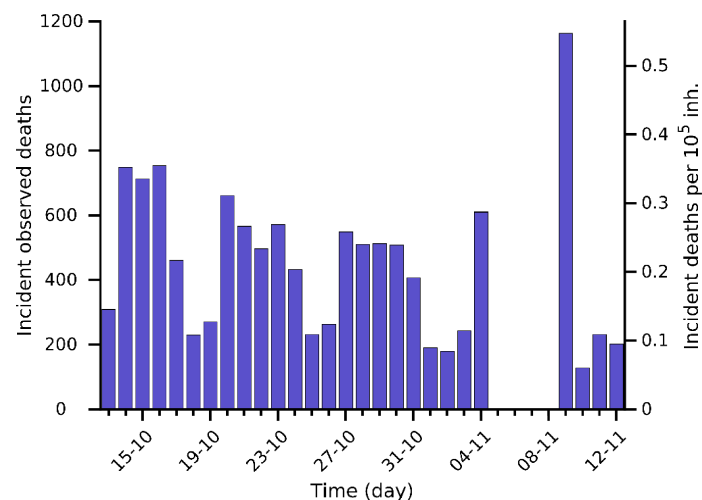
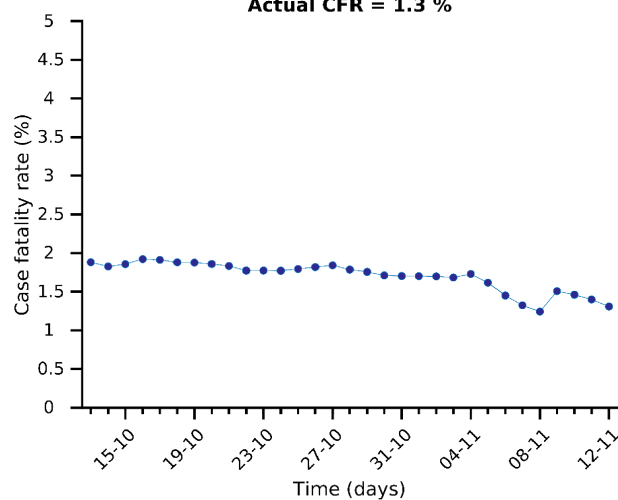
Actual $\rho_7 = 1.3$



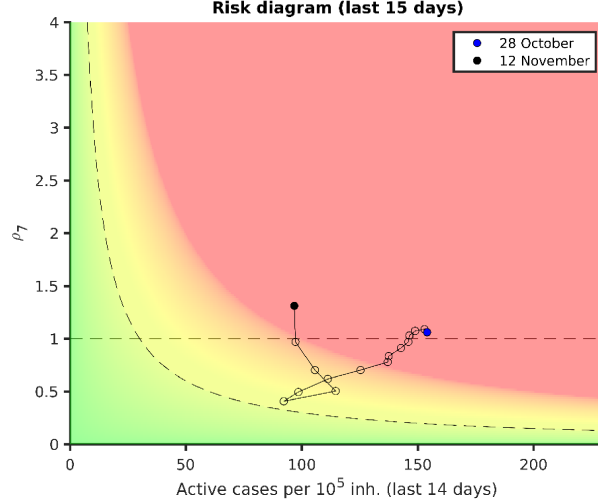
BIOCOM-Cov2 Degree = 7



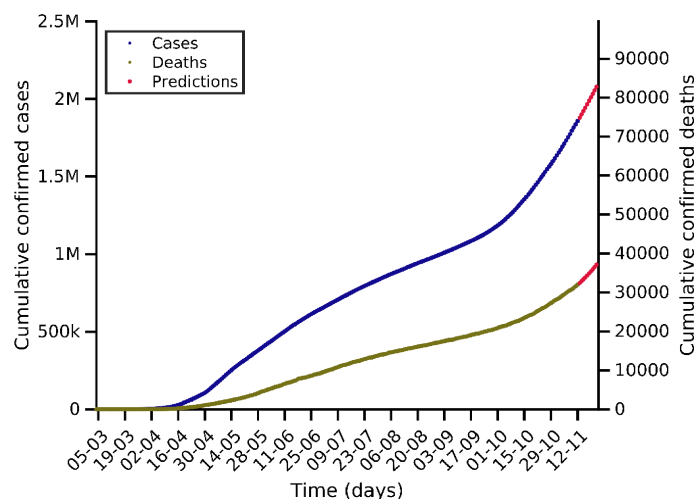
Actual CFR = 1.3 %



Risk diagram (last 15 days)



Russia 12-11-2020. Pop: 145.9M. Cumulative incidence: 1274/10⁵

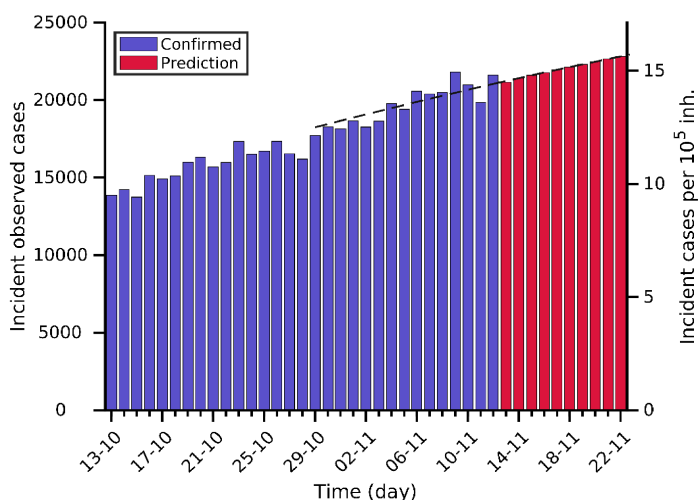


Predictions for next days

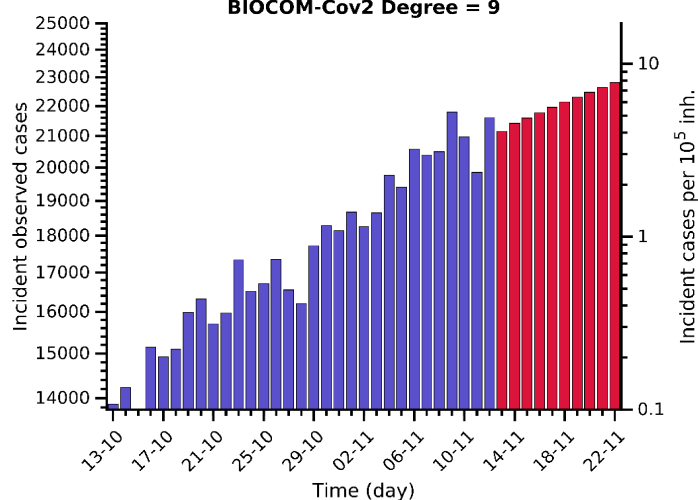
Day	Number of cases	95% Confidence Interval
15-11-2020	1922729 (+64161)	[1913541 - 1931917]
19-11-2020	2010897 (+152329)	[1989493 - 2032301]
22-11-2020	2078831 (+220263)	[2037326 - 2120336]

Current indicators

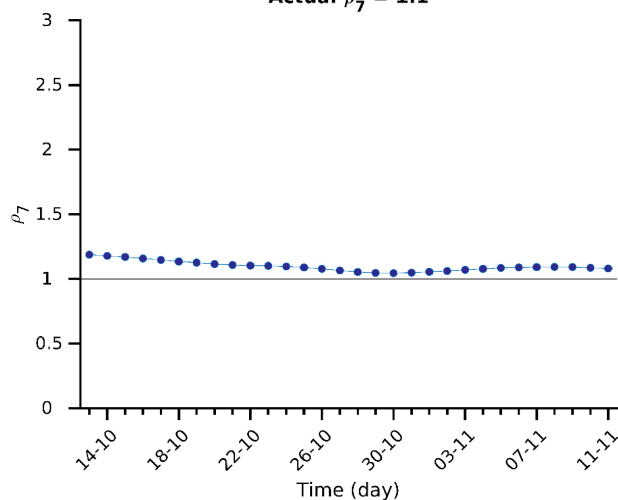
	A14	EPG	CFR	N7	D7
Today	190	205	2.33 %	20816	360
A Week ago	171	184	2.53 %	18738	315
Maximum	190	205	4.72 %	20816	360



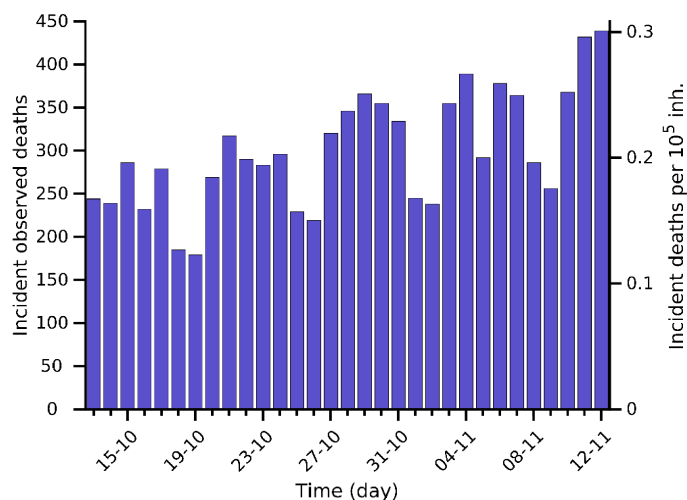
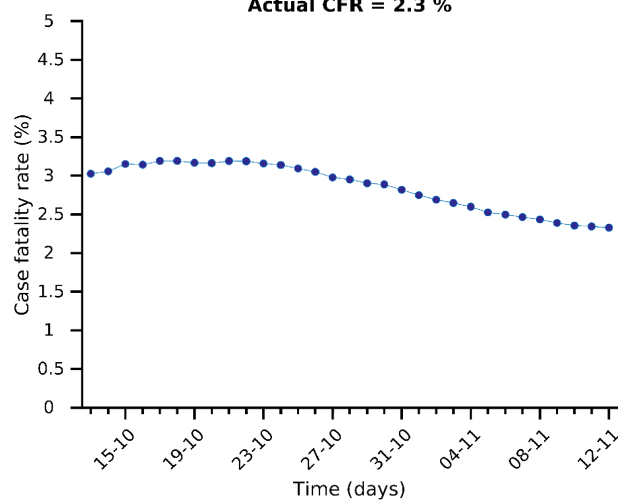
BIOCOM-Cov2 Degree = 9



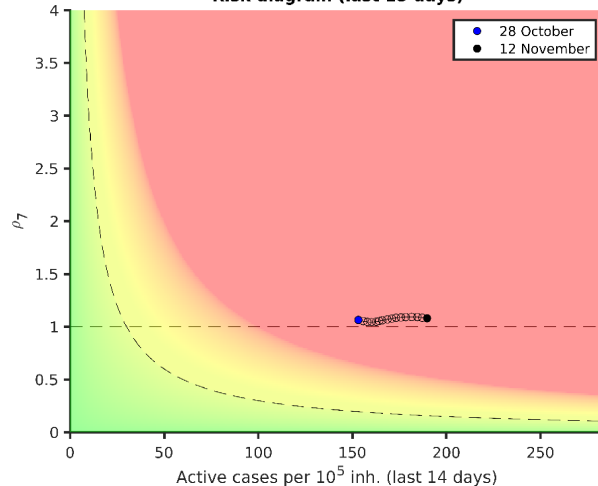
Actual $\rho_7 = 1.1$



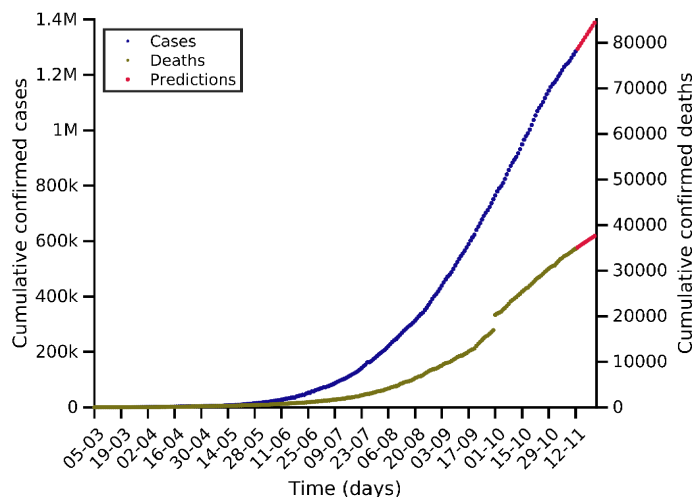
Actual CFR = 2.3 %



Risk diagram (last 15 days)



Argentina 12-11-2020. Pop: 45.2M. Cumulative incidence: 2842/10⁵

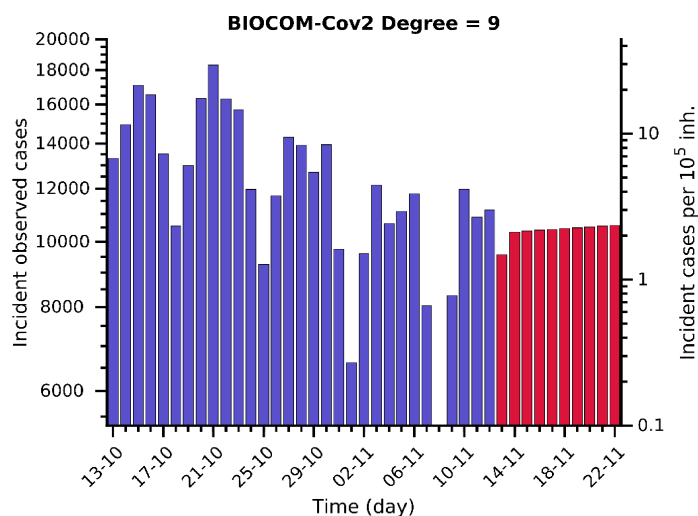
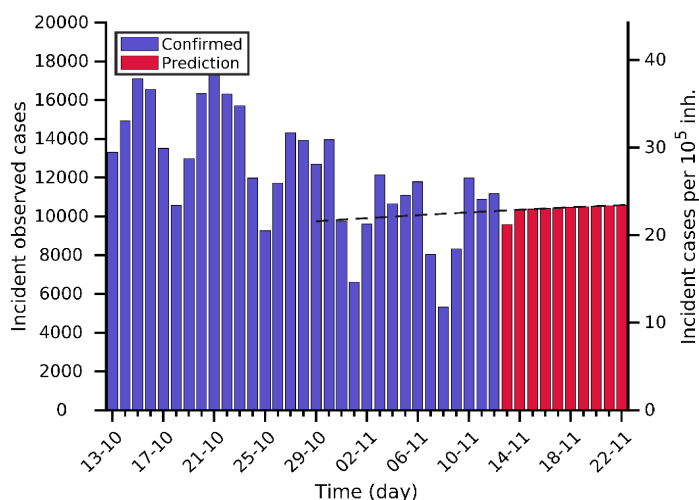


Predictions for next days

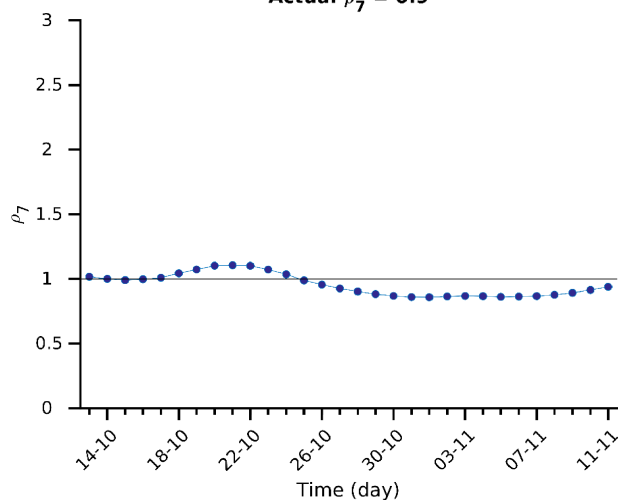
Day	Number of cases	95% Confidence Interval
15-11-2020	1314795 (+30291)	[1298164 - 1331425]
19-11-2020	1356596 (+72092)	[1318881 - 1394310]
22-11-2020	1388248 (+103744)	[1316112 - 1460385]

Current indicators

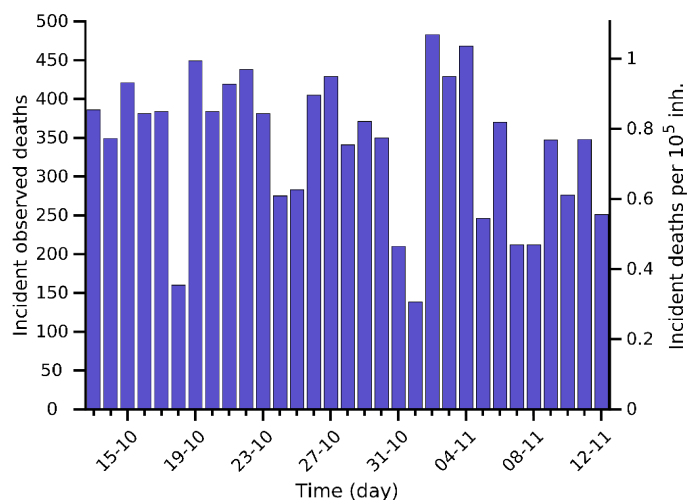
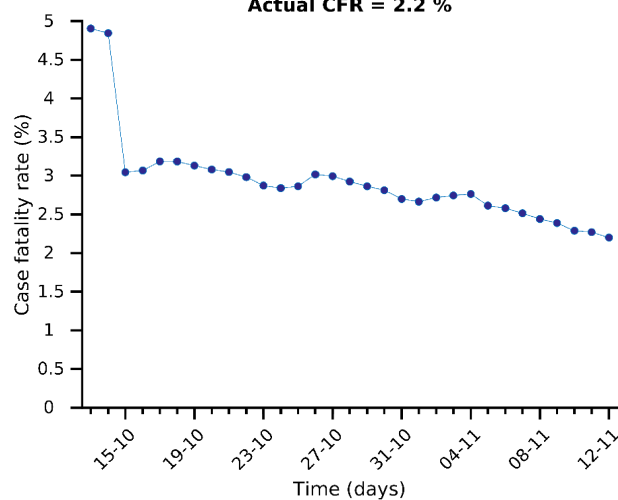
	A14	EPG	CFR	N7	D7
Today	313	293	2.20 %	9641	288
A Week ago	361	313	2.61 %	10543	332
Maximum	442	483	4.91 %	15051	789



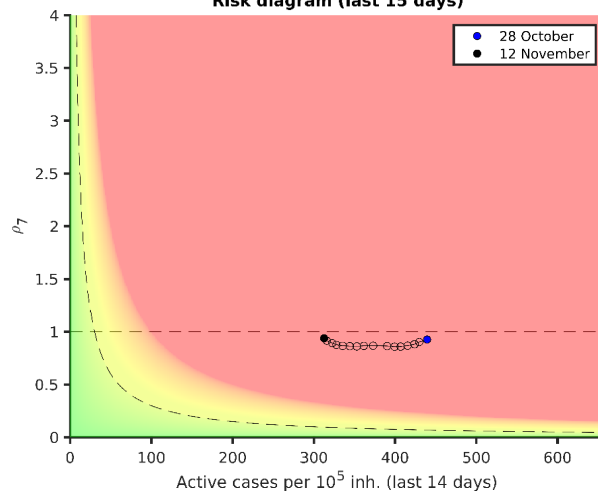
Actual $\rho_7 = 0.9$



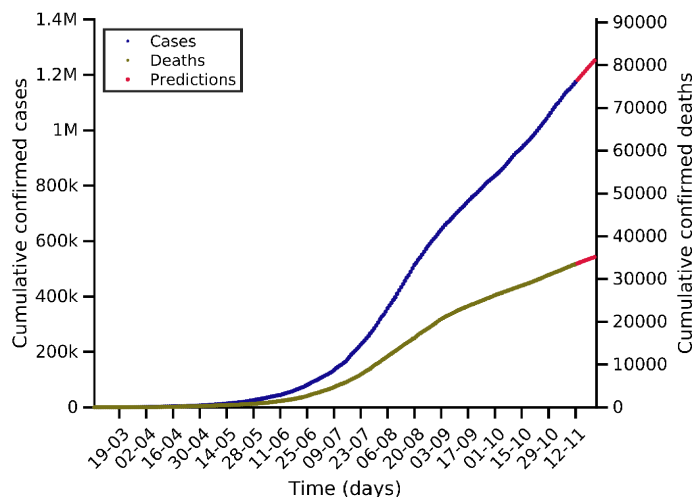
Actual CFR = 2.2 %



Risk diagram (last 15 days)



Colombia 12-11-2020. Pop: 50.9M. Cumulative incidence: 2307/10⁵

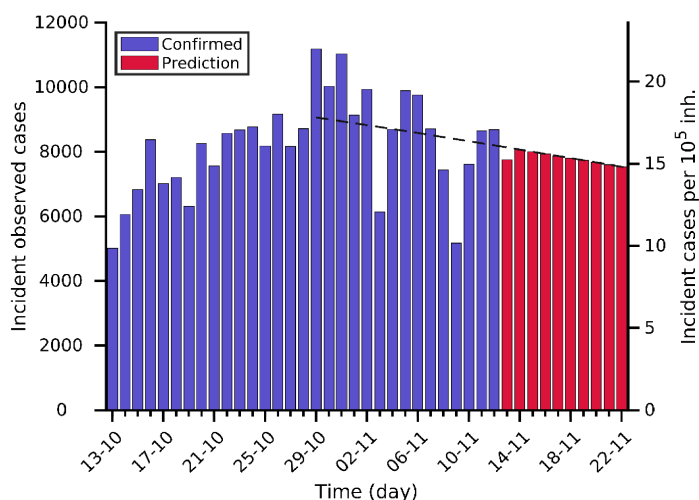


Predictions for next days

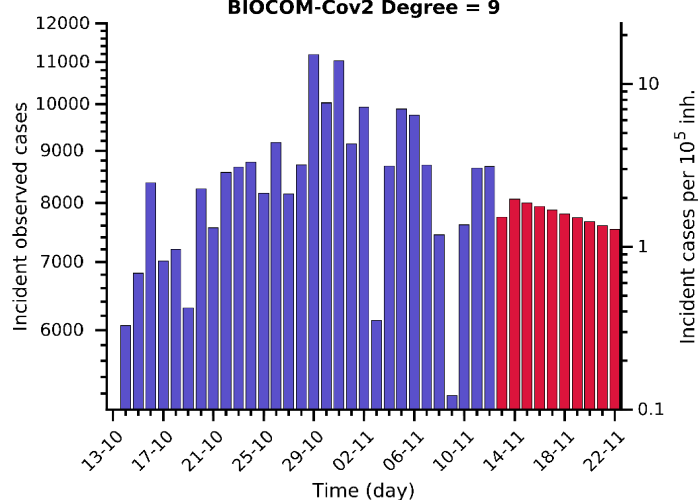
Day	Number of cases	95% Confidence Interval
15-11-2020	1197829 (+23817)	[1185496 - 1210163]
19-11-2020	1229173 (+55161)	[1211840 - 1246506]
22-11-2020	1251980 (+77968)	[1227461 - 1276499]

Current indicators

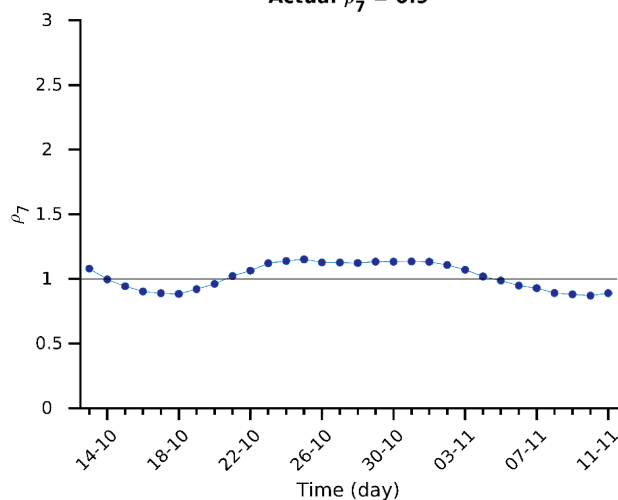
	A14	EPG	CFR	N7	D7
Today	238	211	2.46 %	8005	183
A Week ago	251	256	2.53 %	9265	183
Maximum	307	329	4.88 %	11550	326



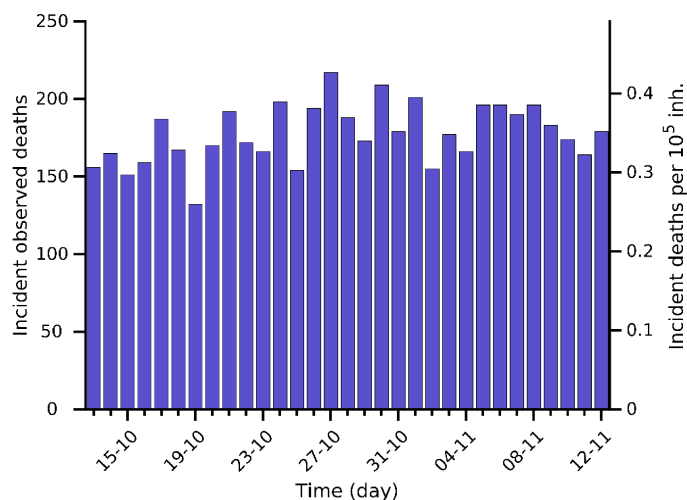
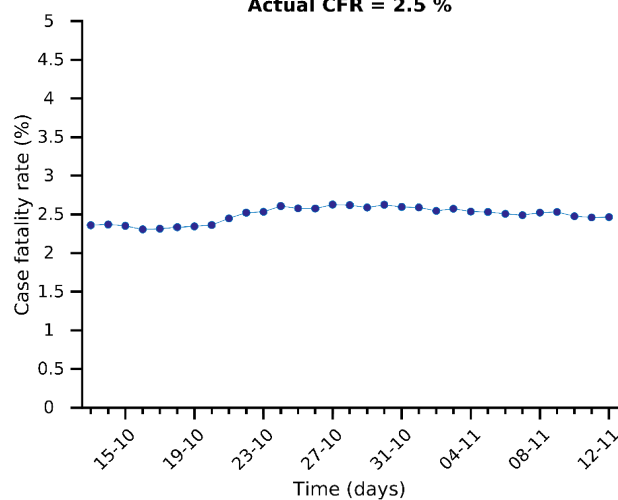
BIOCOM-Cov2 Degree = 9



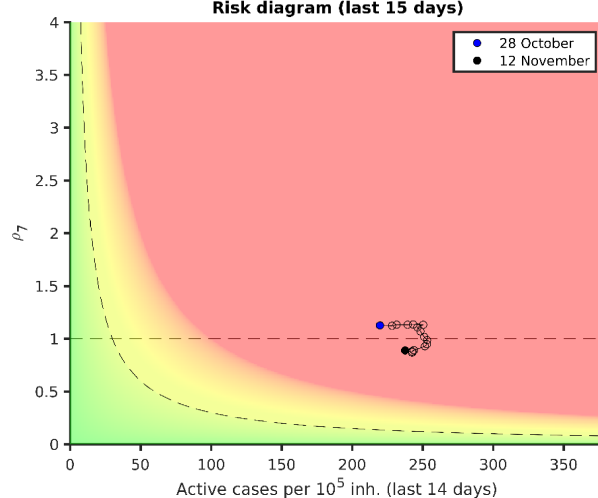
Actual $\rho_7 = 0.9$



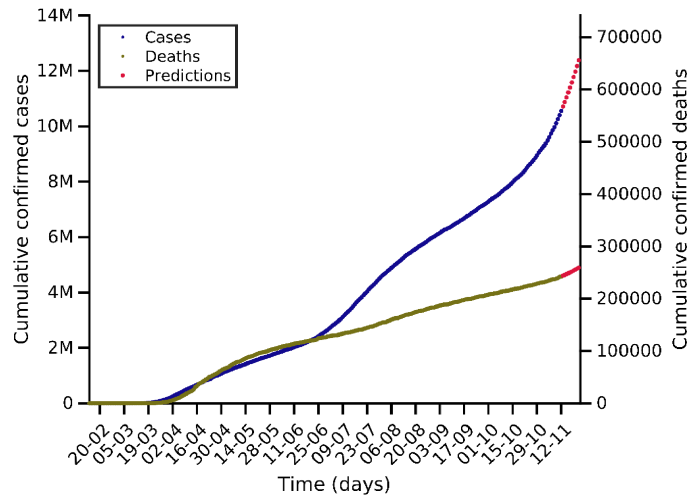
Actual CFR = 2.5 %



Risk diagram (last 15 days)

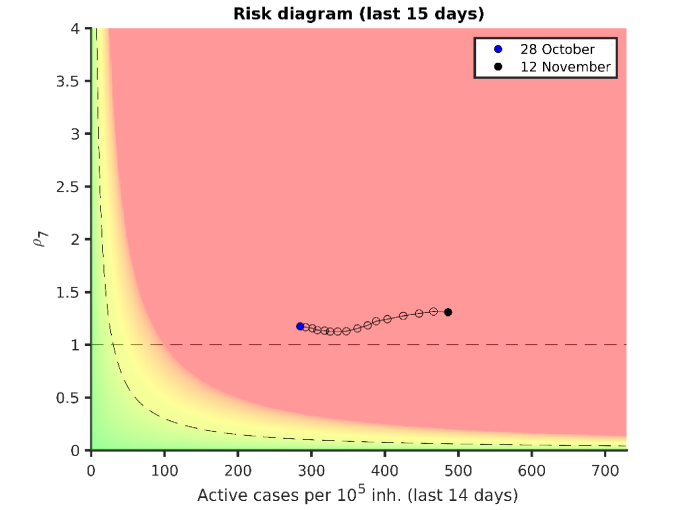
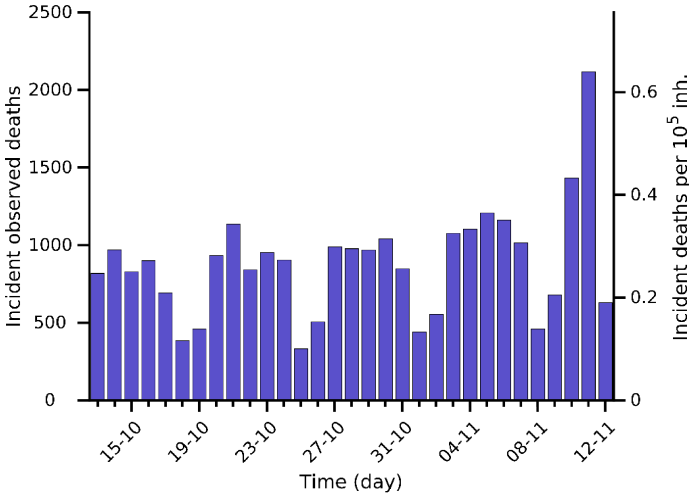
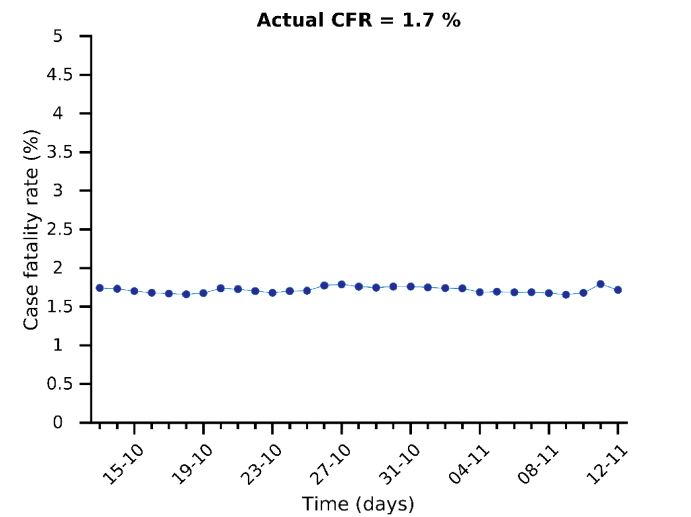
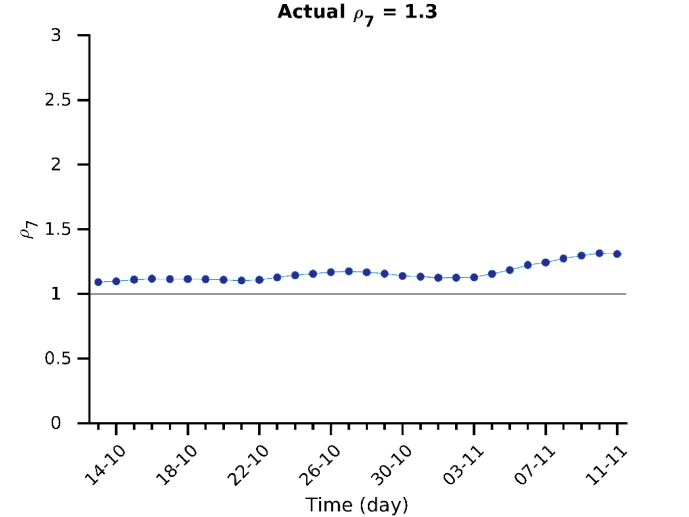
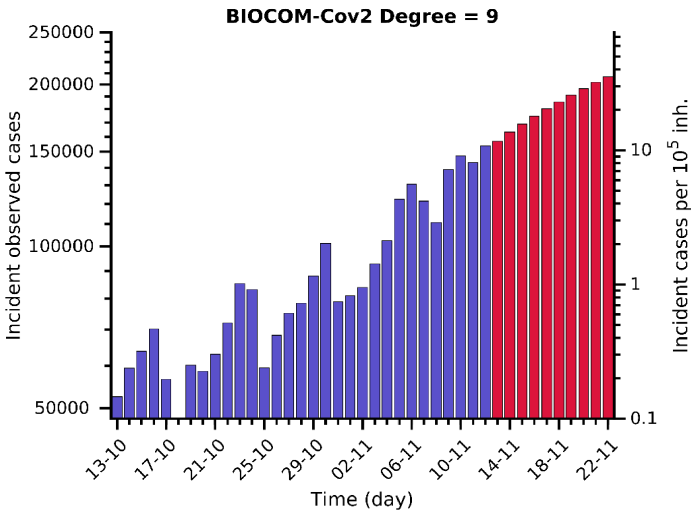
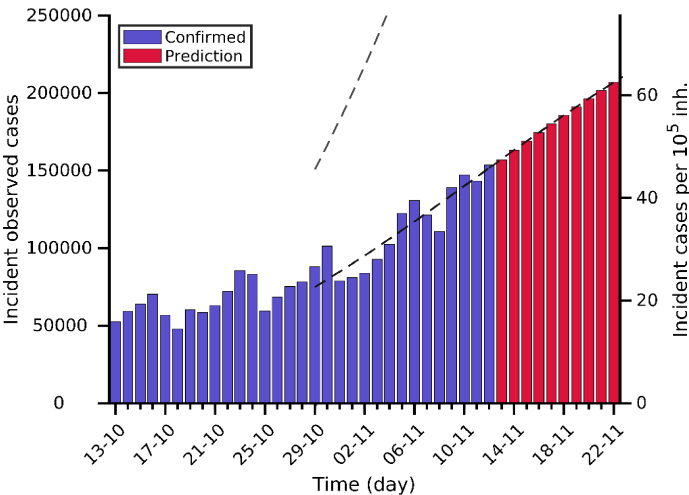


USA 12-11-2020. Pop: 331.0M. Cumulative incidence: 3189/10⁵

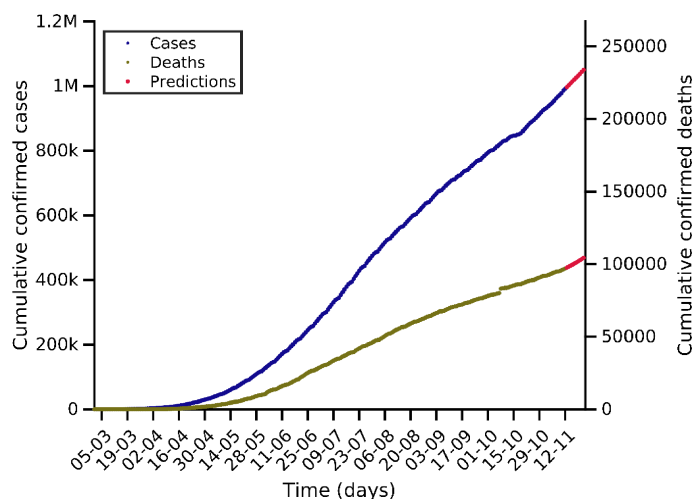


Predictions for next days		
Day	Number of cases	95% Confidence Interval
15-11-2020	11043889 (+489088)	[10997071 - 11090706]
19-11-2020	11775605 (+1220804)	[11649789 - 11901420]
22-11-2020	12380764 (+1825963)	[12122608 - 12638920]

Current indicators					
	A14	EPG	CFR	N7	D7
Today	486	636	1.72 %	135126	1070
A Week ago	363	419	1.69 %	94681	896
Maximum	486	636	5.00 %	135126	2715



Mexico 12-11-2020. Pop: 128.9M. Cumulative incidence: 769/10⁵

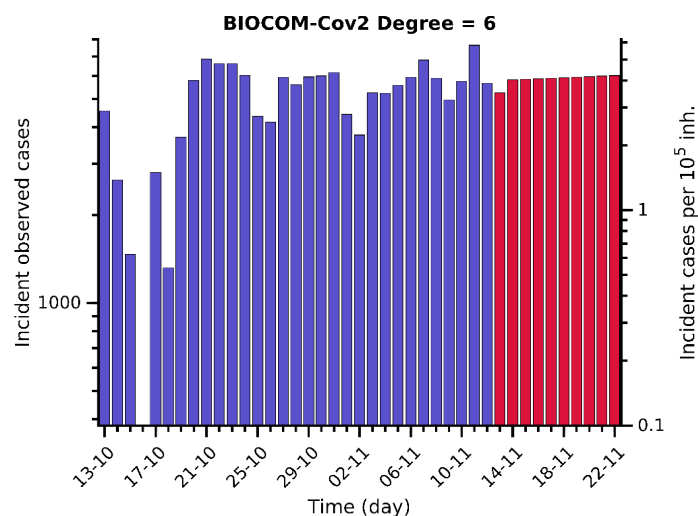
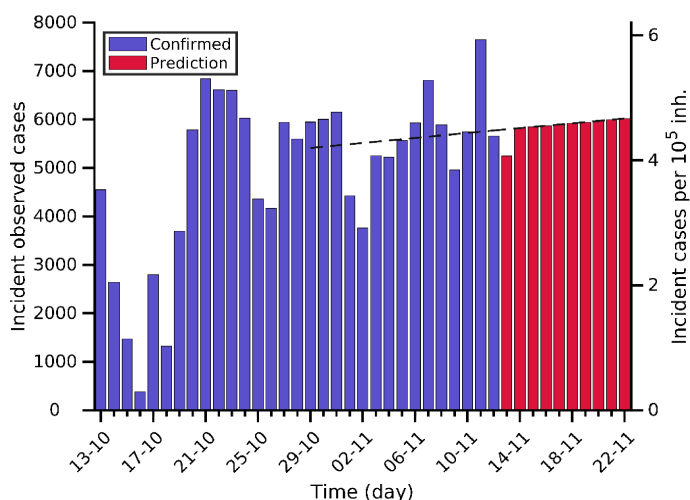


Predictions for next days

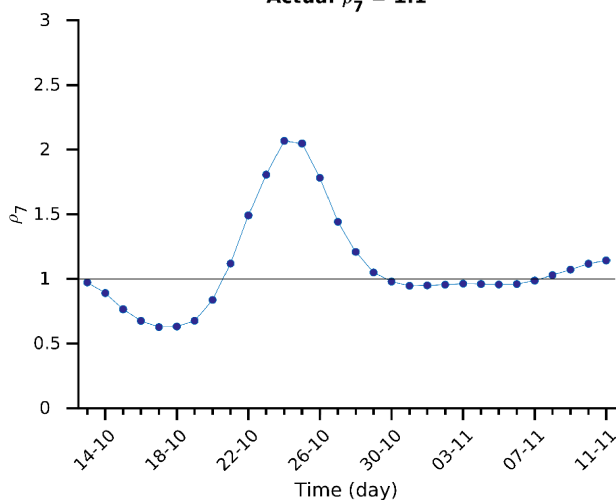
Day	Number of cases	95% Confidence Interval
15-11-2020	1008753 (+16918)	[992162 - 1025345]
19-11-2020	1032389 (+40554)	[994094 - 1070685]
22-11-2020	1050373 (+58538)	[991835 - 1124306]

Current indicators

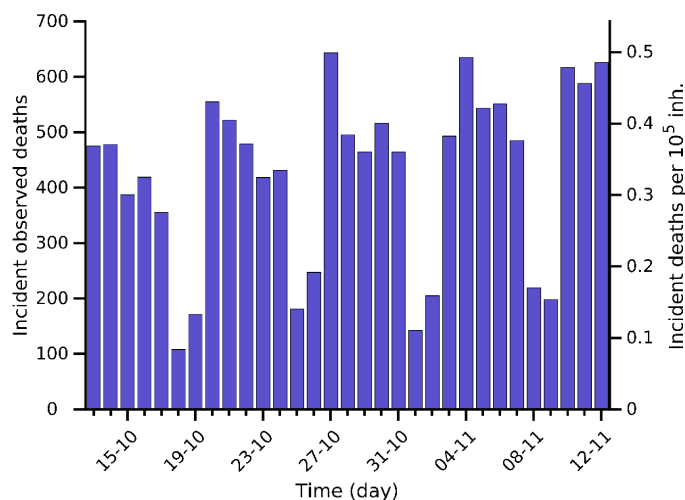
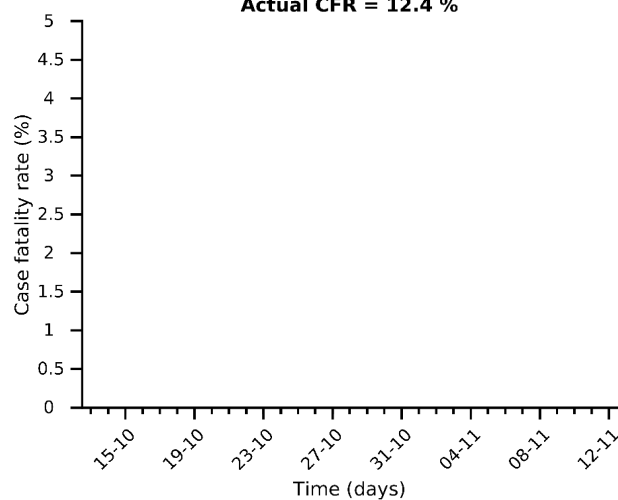
	A14	EPG	CFR	N7	D7
Today	61	70	10.00 %	6091	469
A Week ago	58	56	10.00 %	5198	428
Maximum	77	94	0.00 %	7171	800



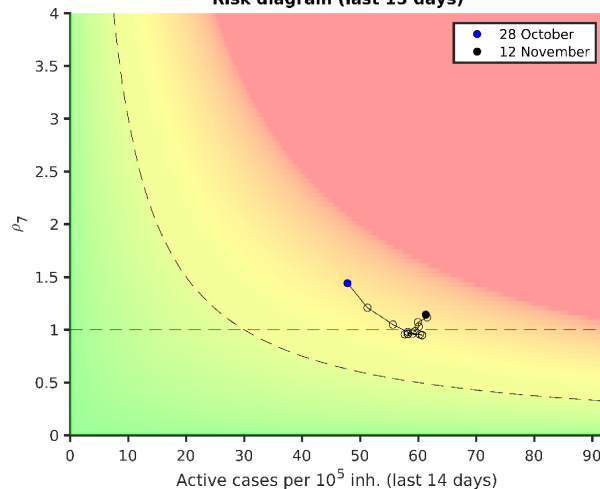
Actual $\rho_7 = 1.1$



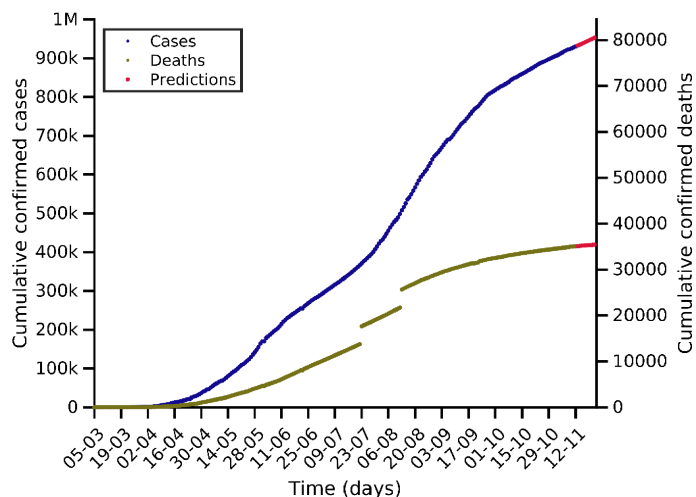
Actual CFR = 12.4 %



Risk diagram (last 15 days)



Peru 12-11-2020. Pop: 33.0M. Cumulative incidence: 2821/10⁵

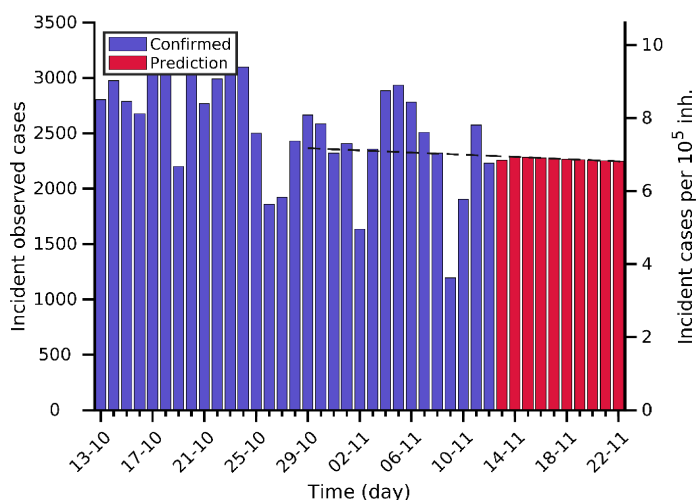


Predictions for next days

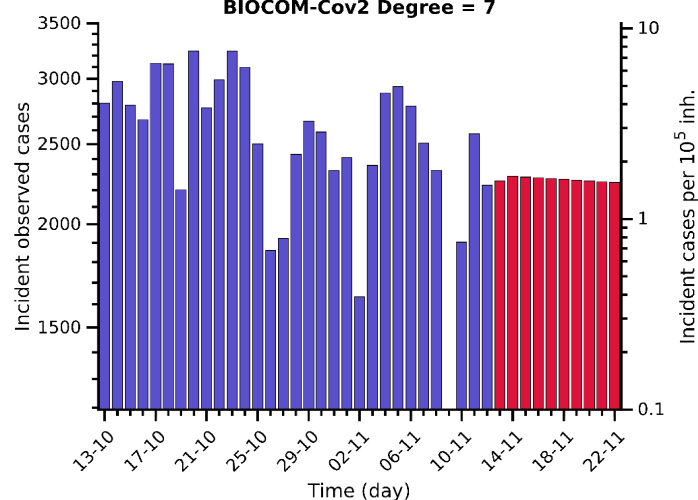
Day	Number of cases	95% Confidence Interval
15-11-2020	937064 (+6827)	[933873 - 940255]
19-11-2020	946143 (+15906)	[938881 - 953404]
22-11-2020	952899 (+22662)	[939240 - 966557]

Current indicators

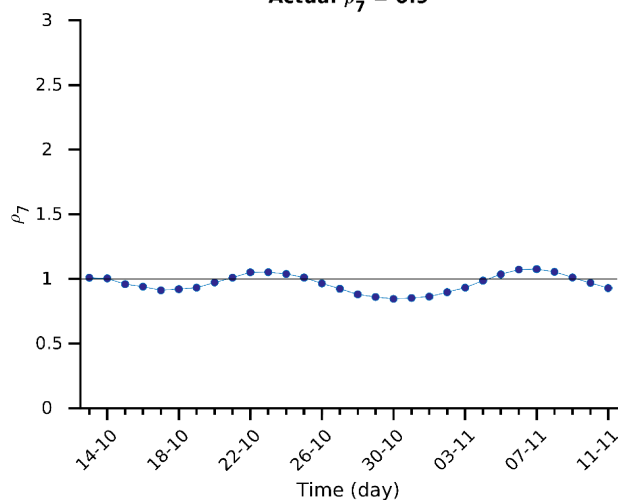
	A14	EPG	CFR	N7	D7
Today	99	92	1.71 %	2216	48
A Week ago	106	104	1.80 %	2447	53
Maximum	357	383	4.98 %	8552	747



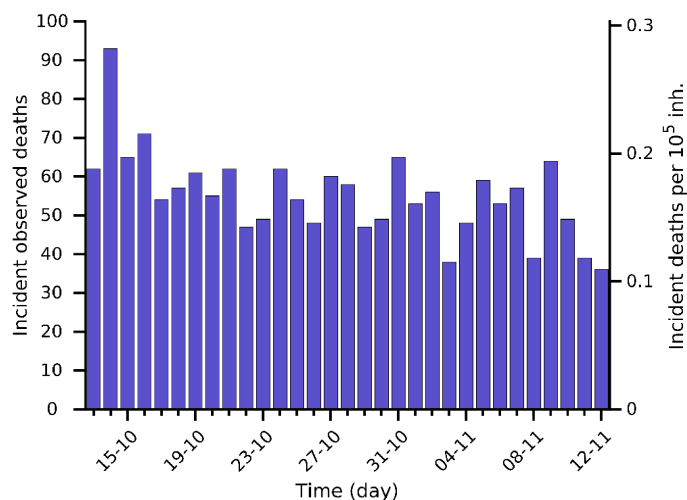
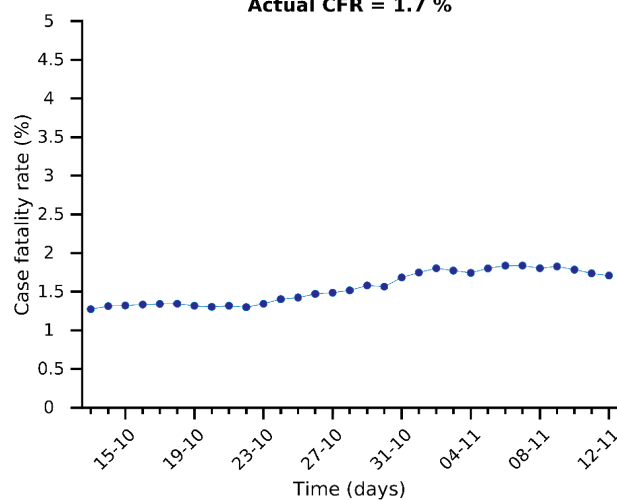
BIOCOM-Cov2 Degree = 7



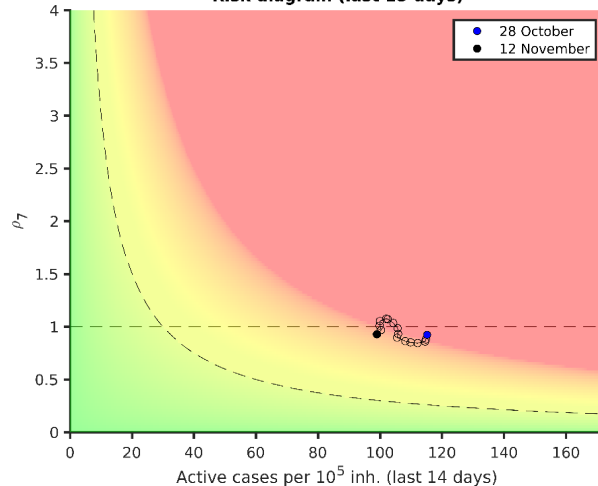
Actual $\rho_7 = 0.9$



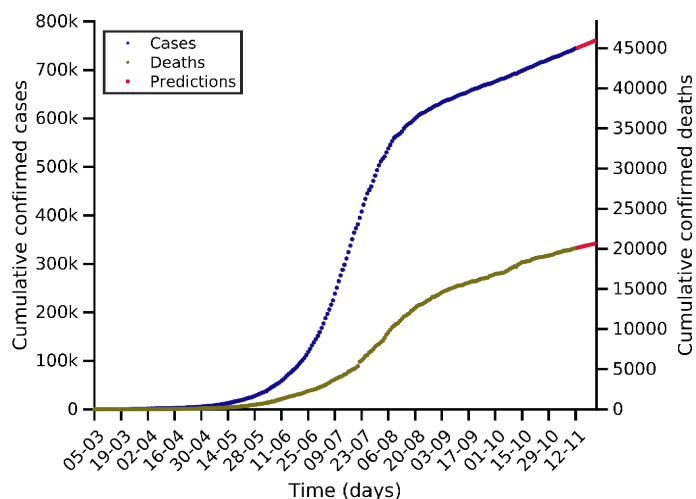
Actual CFR = 1.7 %



Risk diagram (last 15 days)



South Africa 12-11-2020. Pop: 59.3M. Cumulative incidence: 1256/10⁵

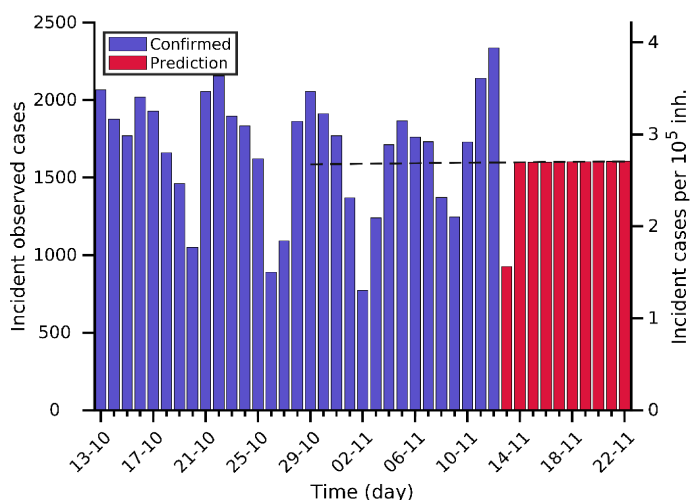


Predictions for next days

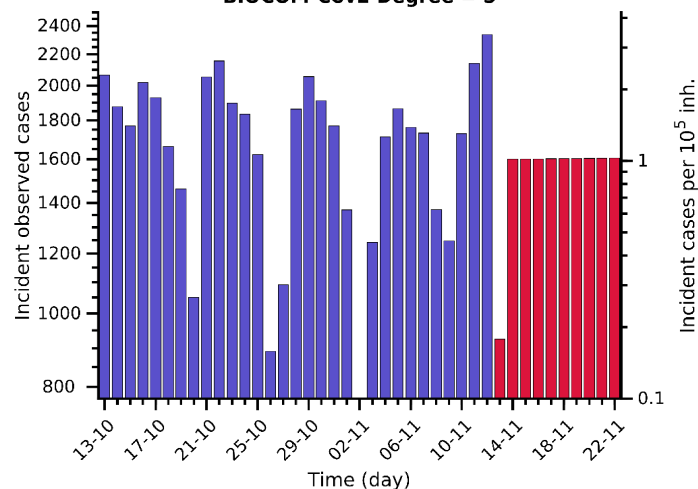
Day	Number of cases	95% Confidence Interval
15-11-2020	748855 (+4123)	[744732 - 758190]
19-11-2020	755261 (+10529)	[744732 - 774842]
22-11-2020	760072 (+15340)	[744732 - 797207]

Current indicators

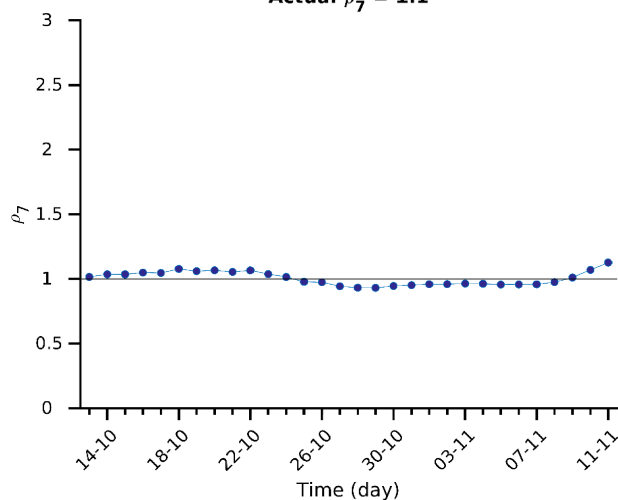
	A14	EPG	CFR	N7	D7
Today	39	44	3.86 %	1760	57
A Week ago	37	36	3.77 %	1521	73
Maximum	289	307	4.99 %	12584	297



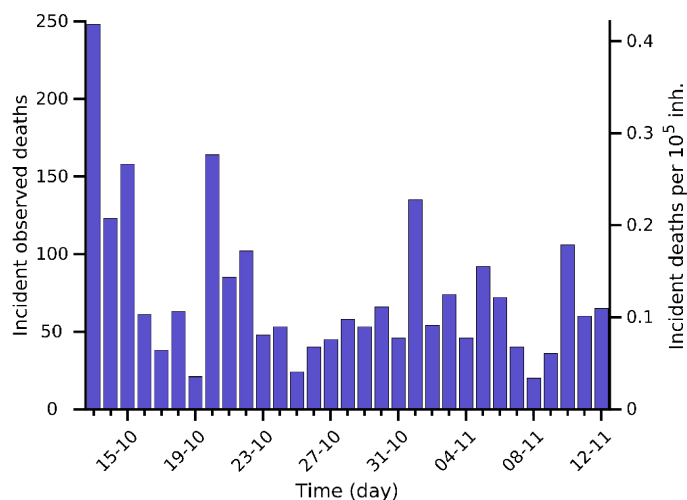
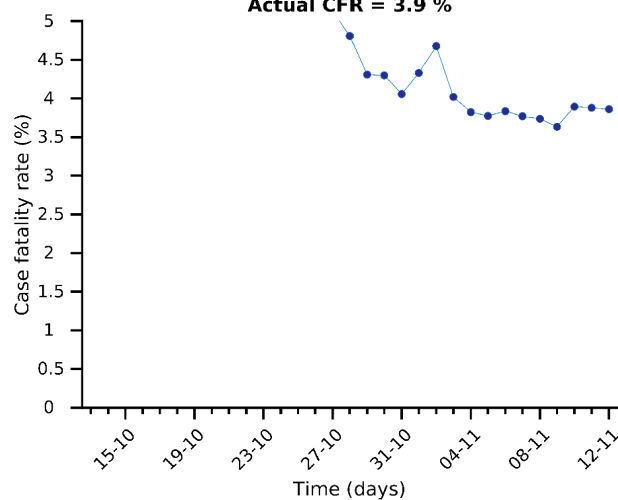
BIOCOM-Cov2 Degree = 5



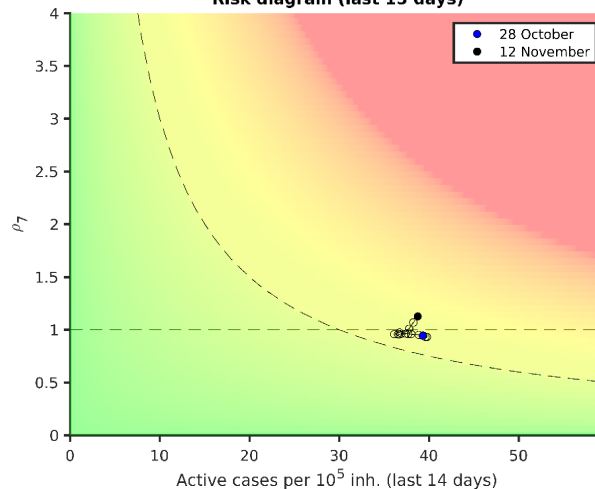
Actual $\rho_7 = 1.1$



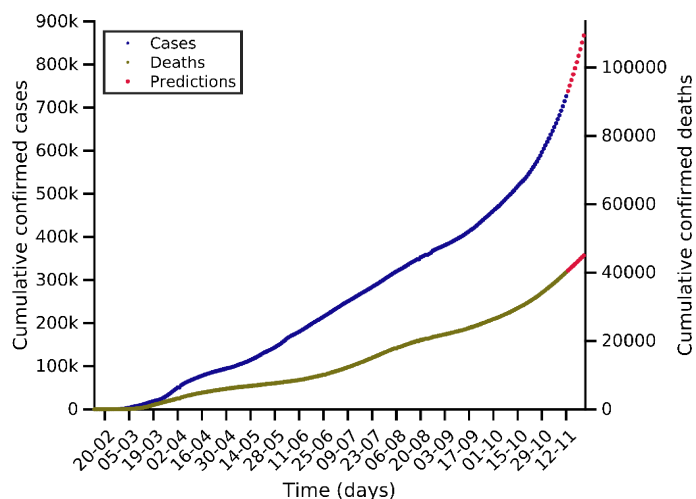
Actual CFR = 3.9 %



Risk diagram (last 15 days)



Iran 12-11-2020. Pop: 84.0M. Cumulative incidence: 865/10⁵

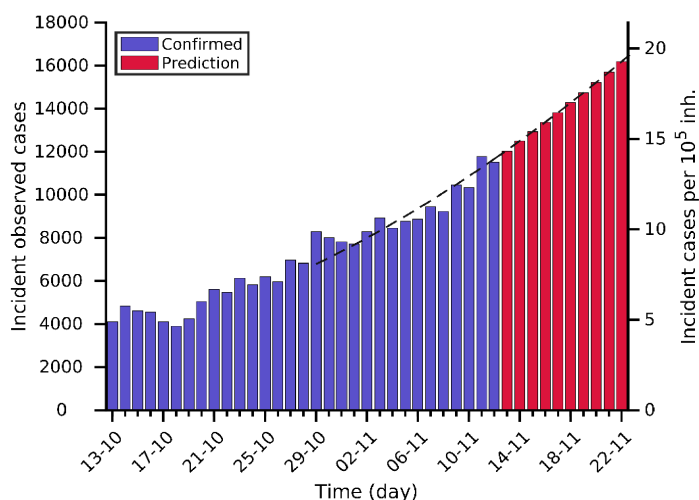


Predictions for next days

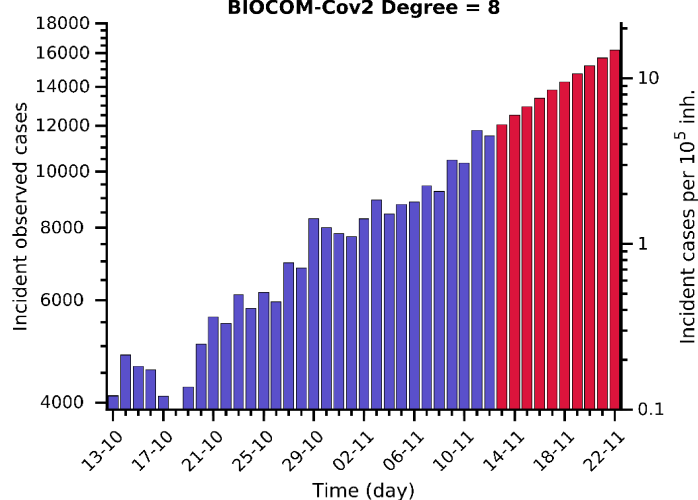
Day	Number of cases	95% Confidence Interval
15-11-2020	764060 (+37475)	[757279 - 770841]
19-11-2020	820282 (+93697)	[801585 - 838979]
22-11-2020	867384 (+140799)	[828064 - 906703]

Current indicators

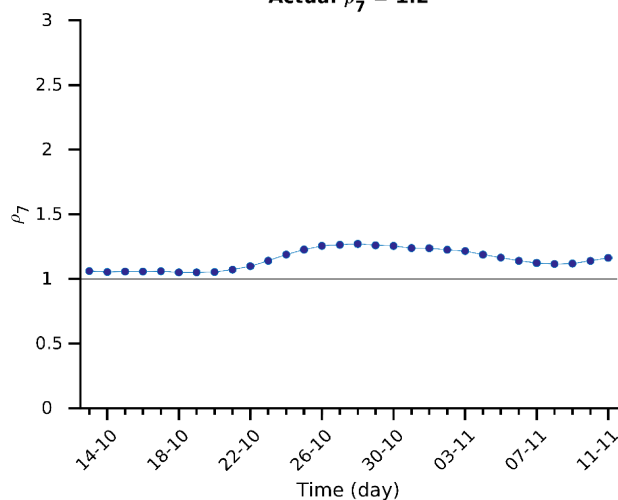
	A14	EPG	CFR	N7	D7
Today	154	179	9.61 %	10236	448
A Week ago	124	147	9.39 %	8285	410
Maximum	154	179	4.99 %	10236	448



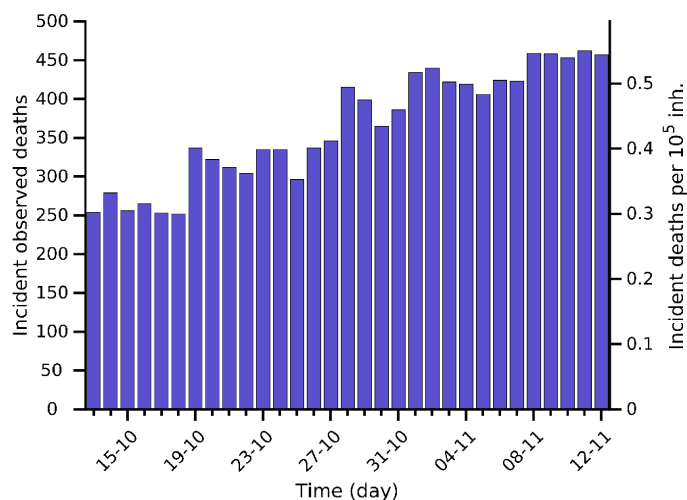
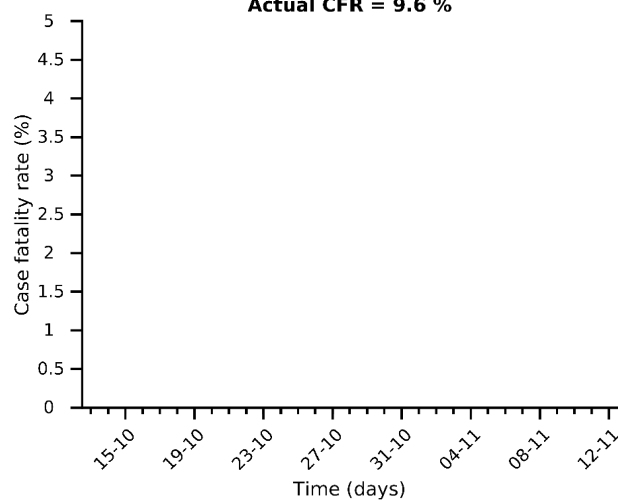
BIOCOM-Cov2 Degree = 8



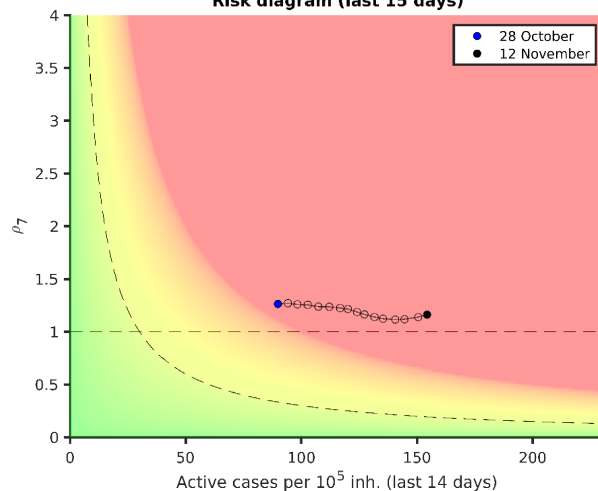
Actual $\rho_7 = 1.2$



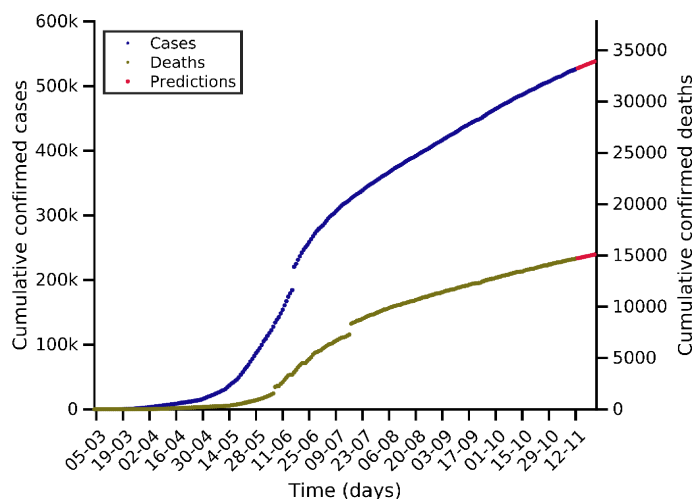
Actual CFR = 9.6 %



Risk diagram (last 15 days)



Chile 12-11-2020. Pop: 19.1M. Cumulative incidence: 2754/10⁵

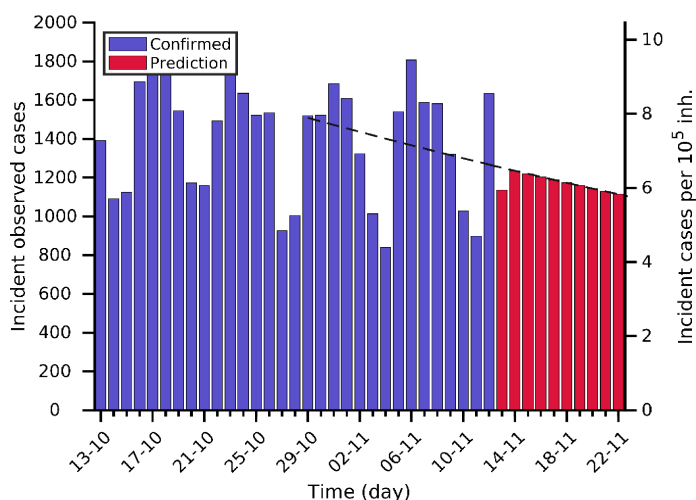


Predictions for next days

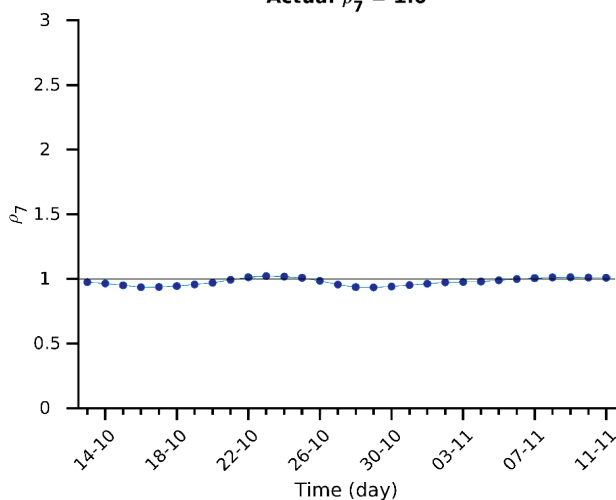
Day	Number of cases	95% Confidence Interval
15-11-2020	530029 (+3591)	[526438 - 534389]
19-11-2020	534753 (+8315)	[526438 - 545578]
22-11-2020	538139 (+11701)	[526438 - 557139]

Current indicators

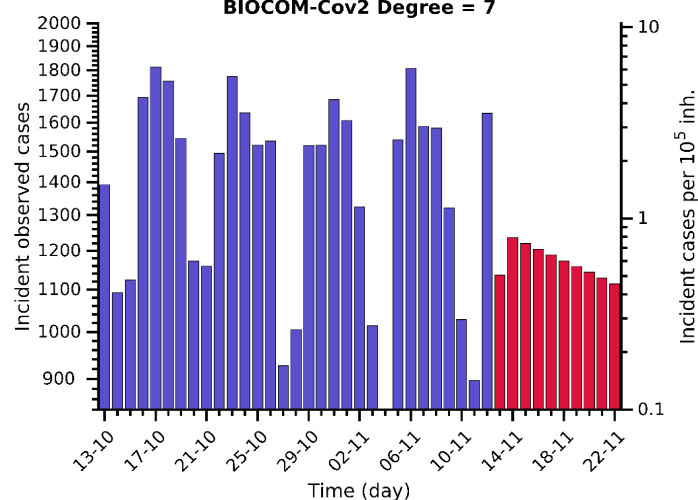
	A14	EPG	CFR	N7	D7
Today	101	102	2.75 %	1408	42
A Week ago	102	100	2.81 %	1362	41
Maximum	570	1031	4.98 %	10305	230



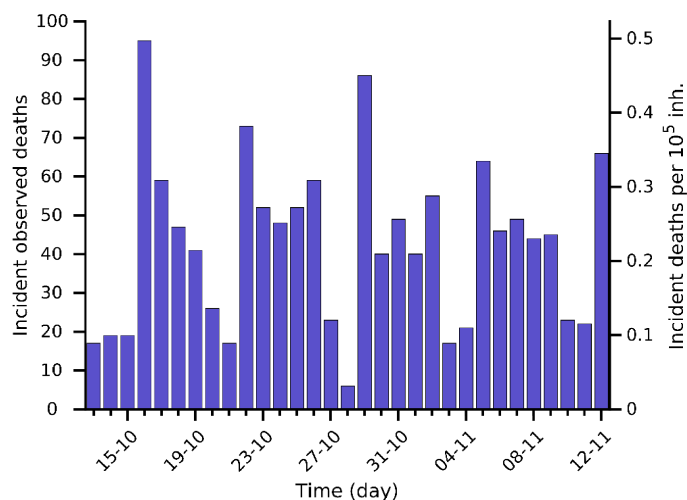
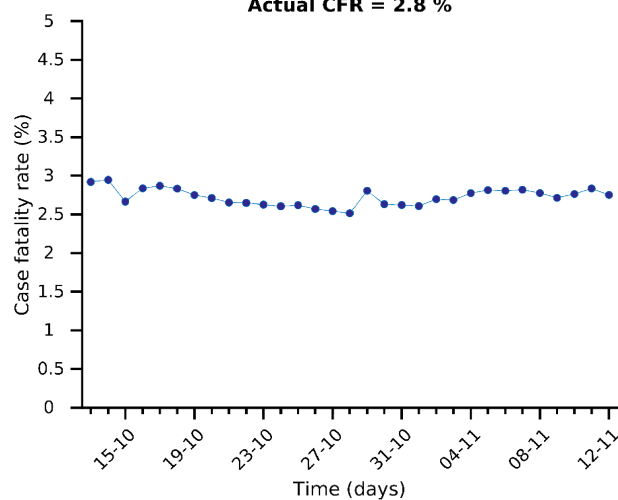
Actual $\rho_7 = 1.0$



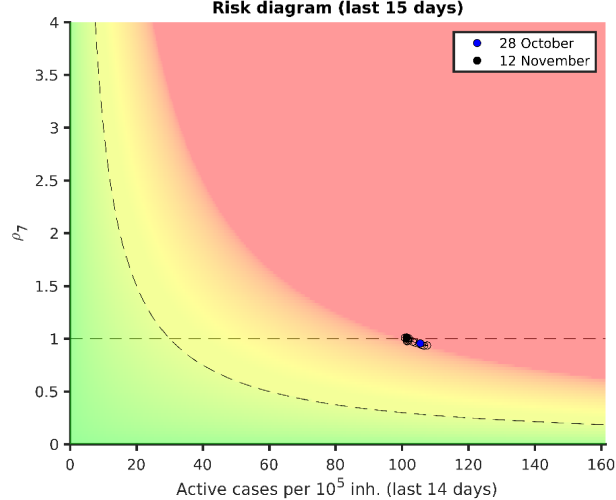
BIOCOM-Cov2 Degree = 7



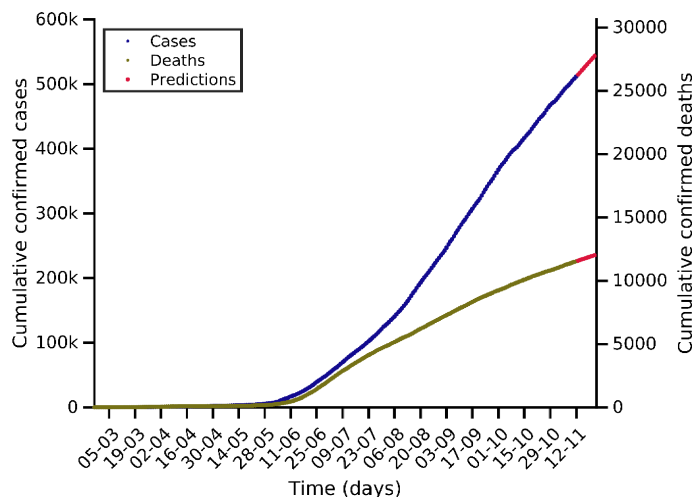
Actual CFR = 2.8 %



Risk diagram (last 15 days)



Iraq 12-11-2020. Pop: 40.2M. Cumulative incidence: 1272/10⁵

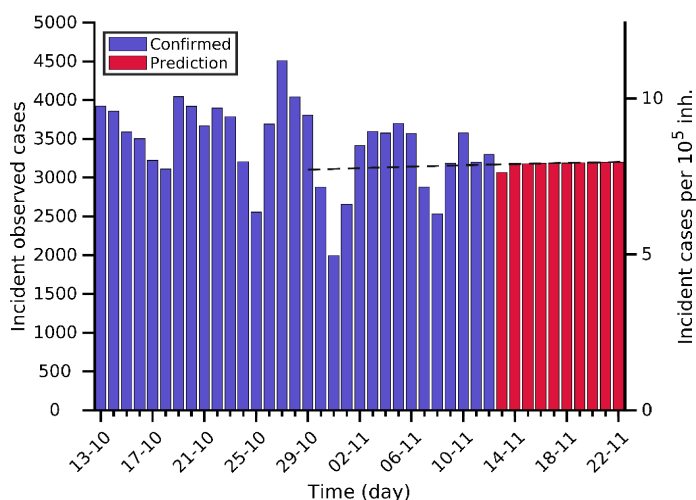


Predictions for next days

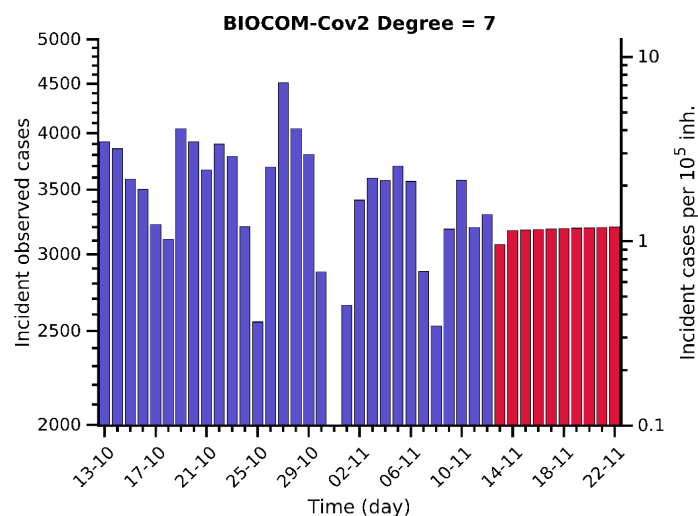
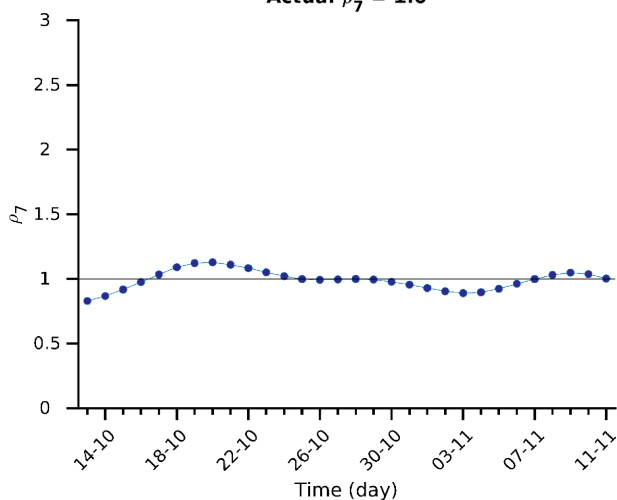
Day	Number of cases	95% Confidence Interval
15-11-2020	521230 (+9424)	[517772 - 524687]
19-11-2020	533979 (+22173)	[526208 - 541750]
22-11-2020	543571 (+31765)	[528772 - 558371]

Current indicators

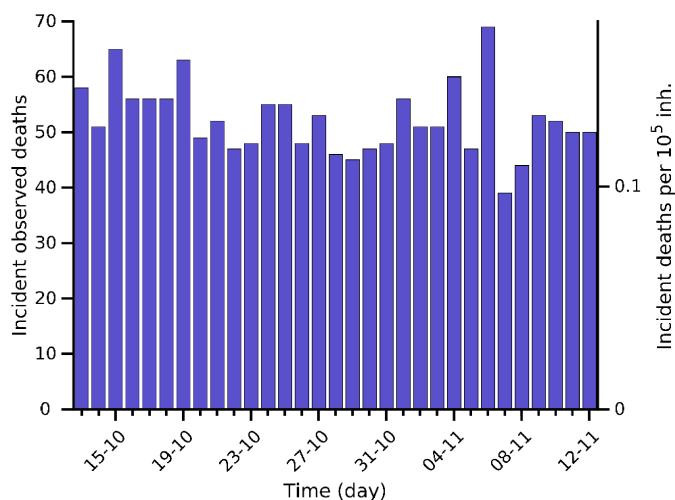
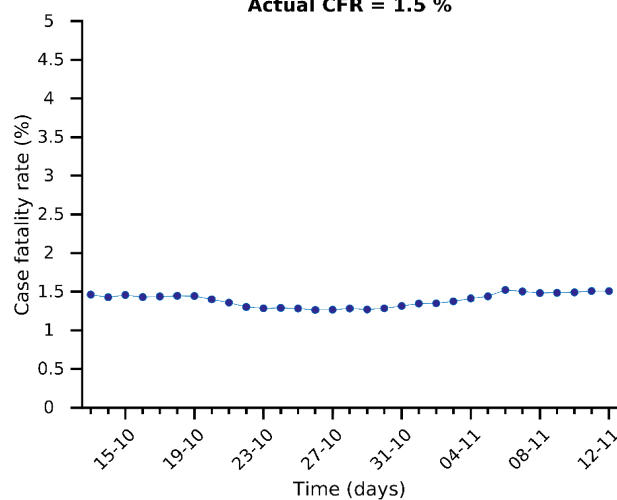
	A14	EPG	CFR	N7	D7
Today	110	110	1.51 %	3176	51
A Week ago	118	106	1.44 %	3117	51
Maximum	151	162	4.96 %	4505	106



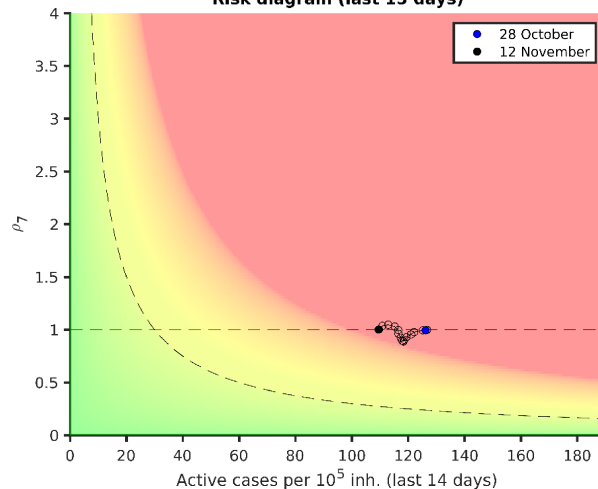
Actual $\rho_7 = 1.0$



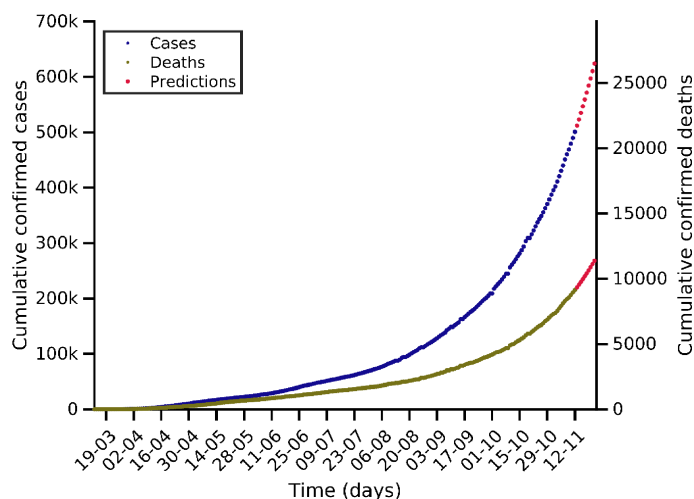
Actual CFR = 1.5 %



Risk diagram (last 15 days)



Ukraine 12-11-2020. Pop: 43.7M. Cumulative incidence: 1145/10⁵

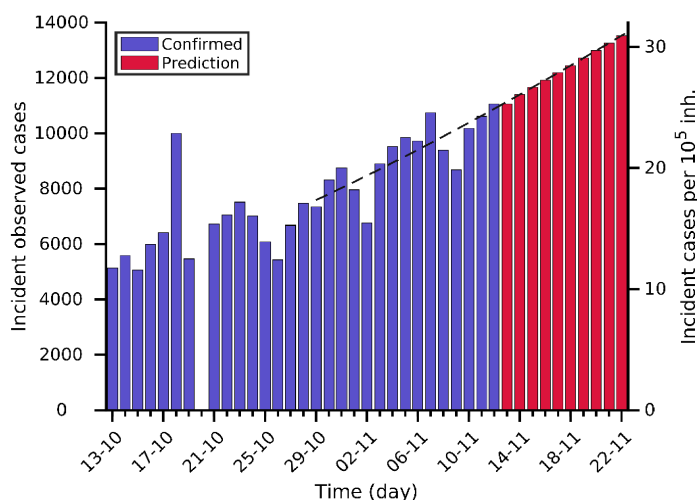


Predictions for next days

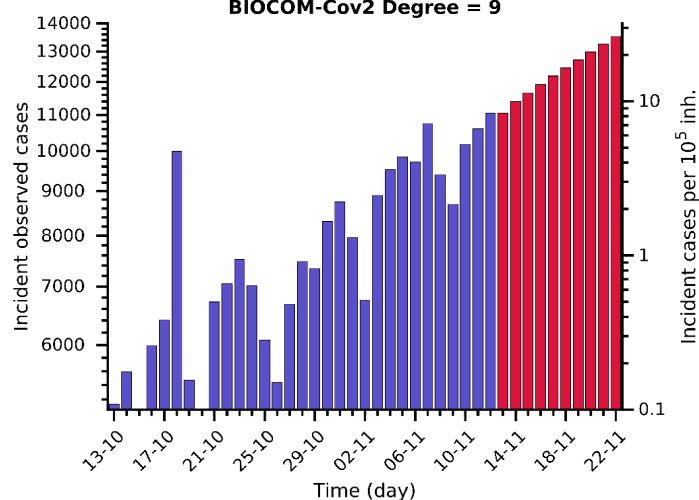
Day	Number of cases	95% Confidence Interval
15-11-2020	534977 (+34112)	[530997 - 538958]
19-11-2020	584253 (+83388)	[574087 - 594419]
22-11-2020	624029 (+123164)	[603398 - 644660]

Current indicators

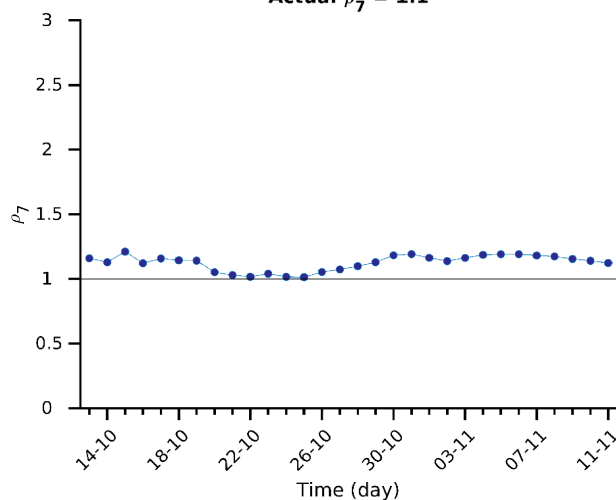
	A14	EPG	CFR	N7	D7
Today	298	335	2.91 %	10057	174
A Week ago	246	292	2.60 %	8579	151
Maximum	298	335	4.96 %	10057	175



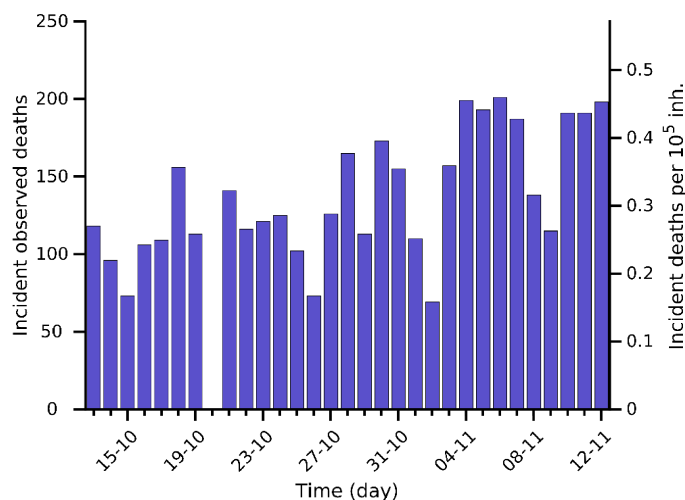
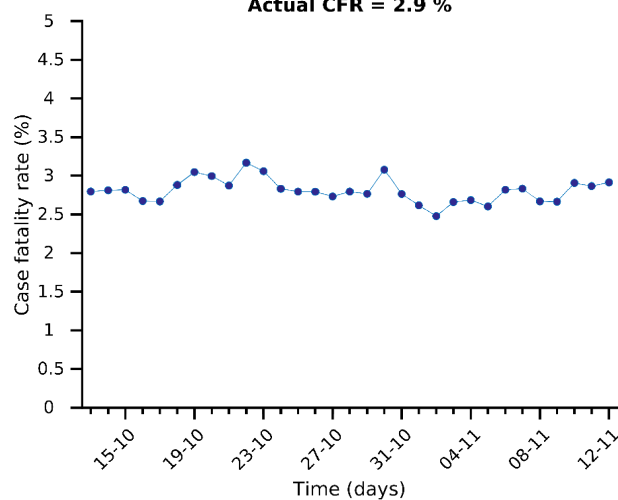
BIOCOM-Cov2 Degree = 9



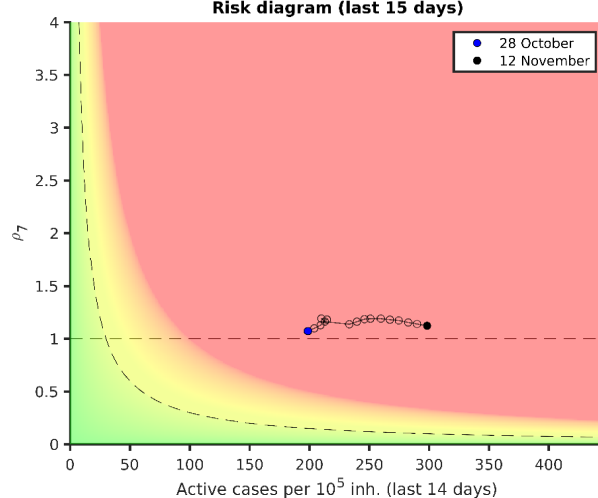
Actual $\rho_7 = 1.1$



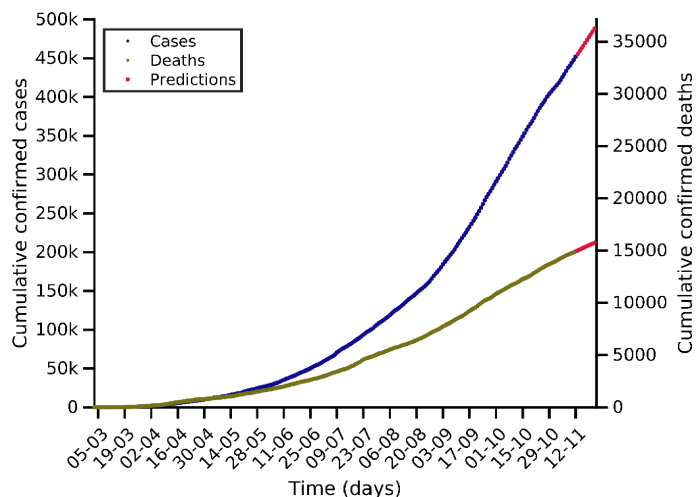
Actual CFR = 2.9 %



Risk diagram (last 15 days)



Indonesia 12-11-2020. Pop: 273.5M. Cumulative incidence: 165/10⁵

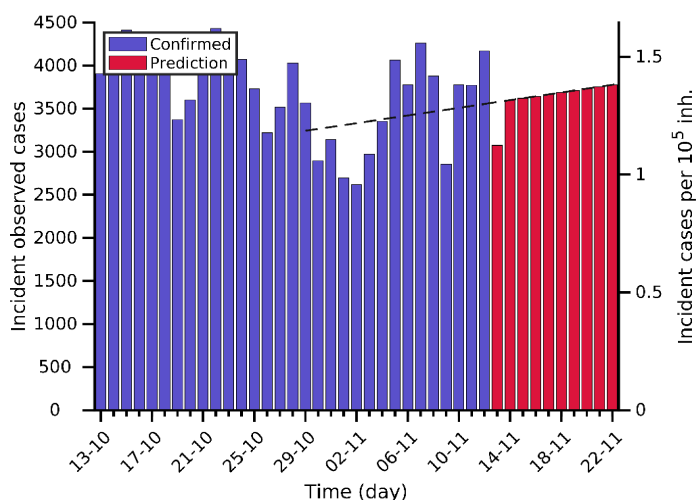


Predictions for next days

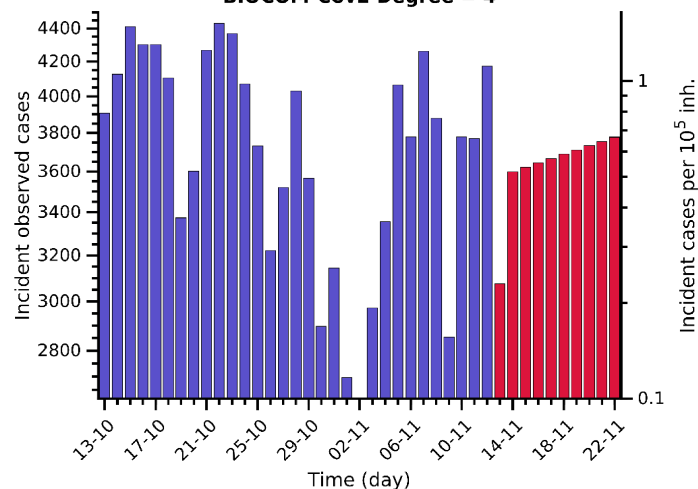
Day	Number of cases	95% Confidence Interval
15-11-2020	462587 (+10296)	[454553 - 470621]
19-11-2020	477296 (+25005)	[458566 - 496026]
22-11-2020	488561 (+36270)	[452291 - 524971]

Current indicators

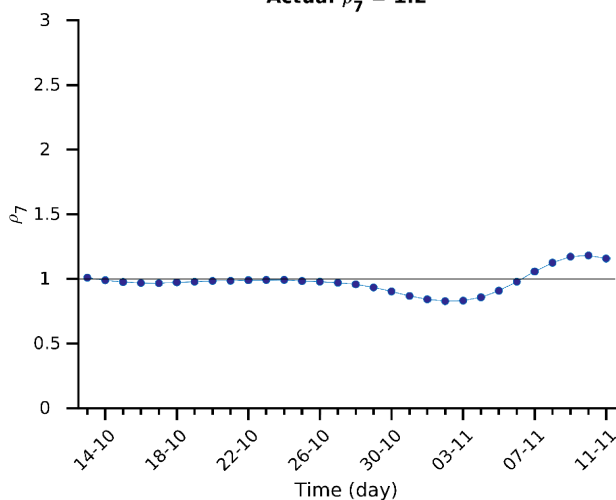
	A14	EPG	CFR	N7	D7
Today	18	20	2.16 %	3785	84
A Week ago	18	15	2.40 %	3107	92
Maximum	22	23	4.98 %	4379	126



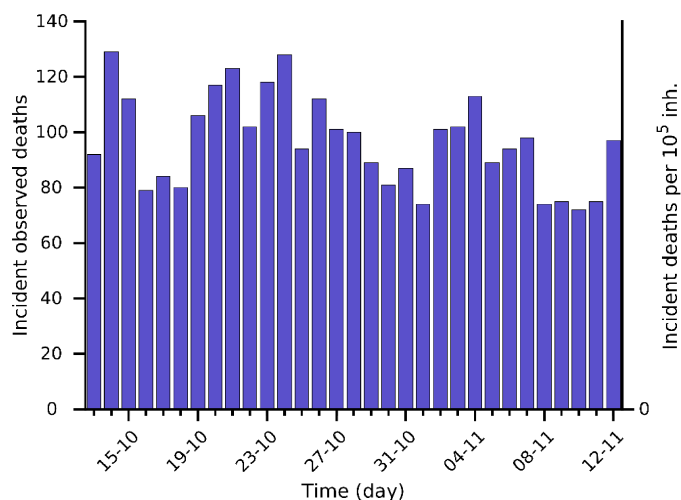
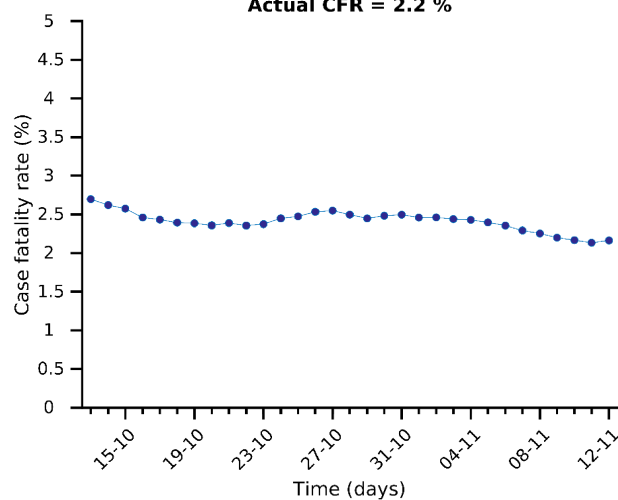
BIOCOM-Cov2 Degree = 4



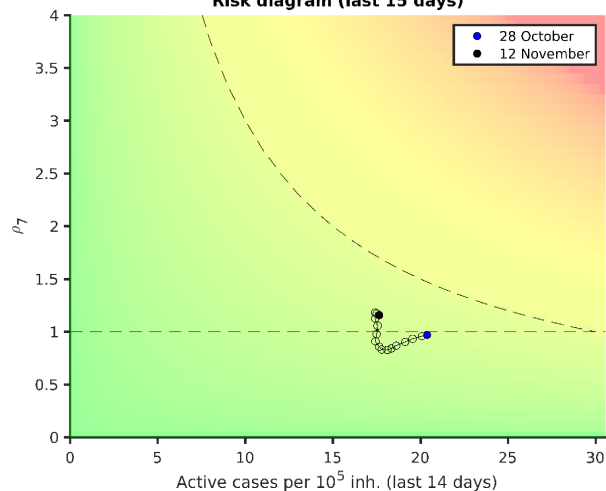
Actual $\rho_7 = 1.2$



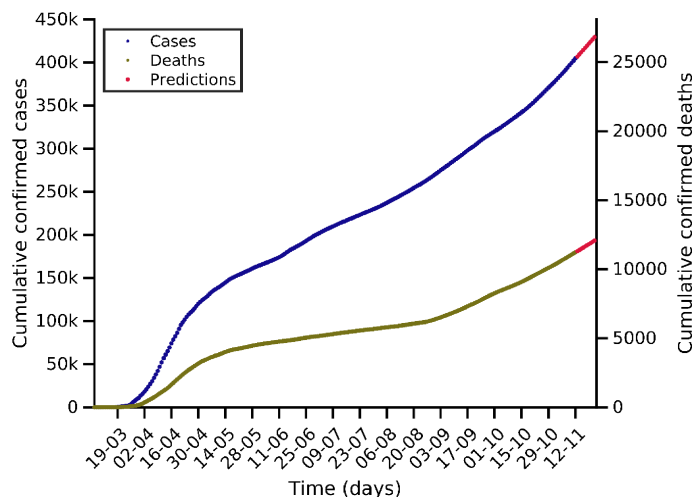
Actual CFR = 2.2 %



Risk diagram (last 15 days)



Turkey 12-11-2020. Pop: 84.3M. Cumulative incidence: 480/10⁵

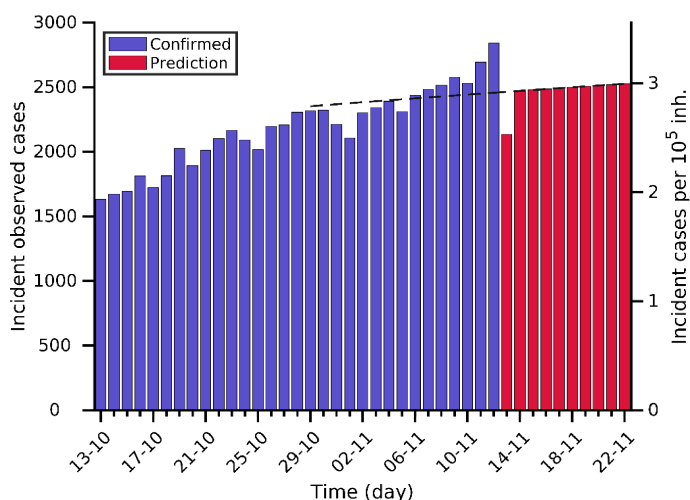


Predictions for next days

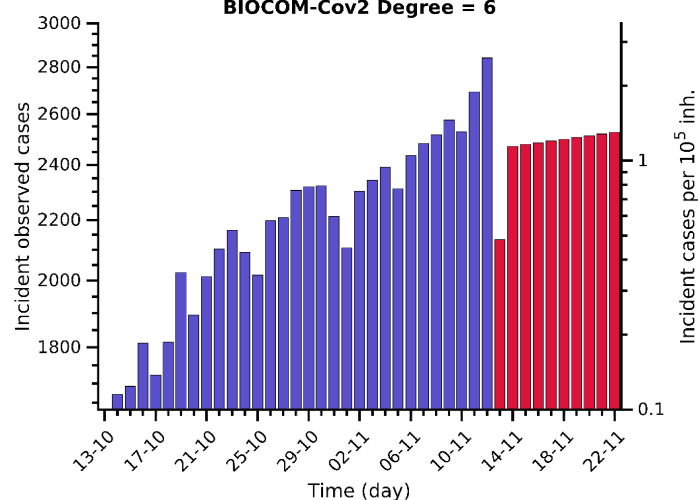
Day	Number of cases	95% Confidence Interval
15-11-2020	411977 (+7083)	[406949 - 417006]
19-11-2020	421960 (+17066)	[410425 - 433496]
22-11-2020	429519 (+24625)	[407345 - 451693]

Current indicators

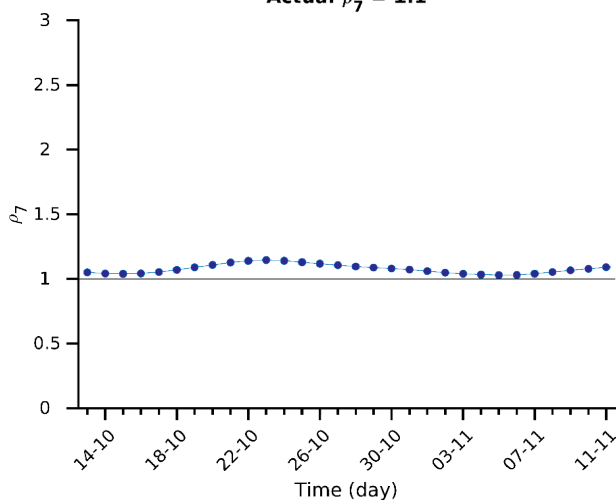
	A14	EPG	CFR	N7	D7
Today	40	44	4.58 %	2582	85
A Week ago	37	38	4.78 %	2284	77
Maximum	73	85	4.93 %	4559	123



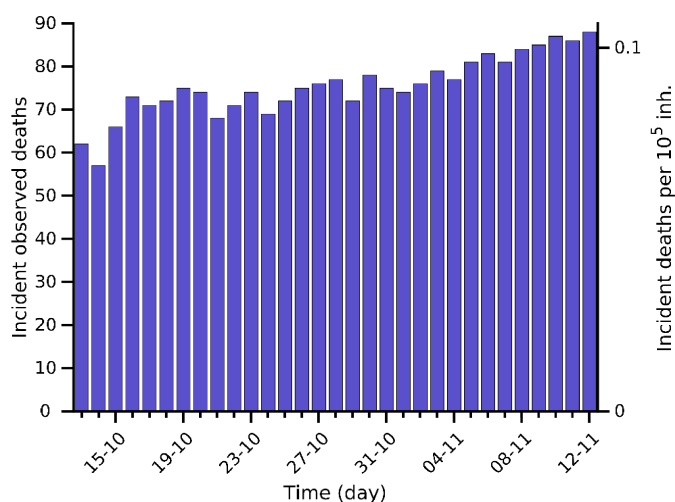
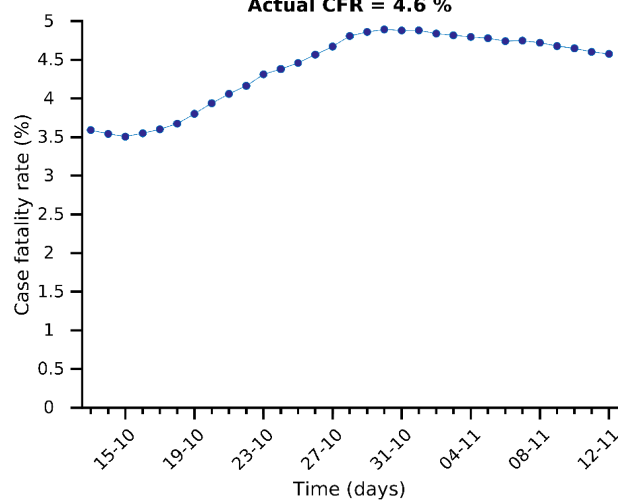
BIOCOM-Cov2 Degree = 6



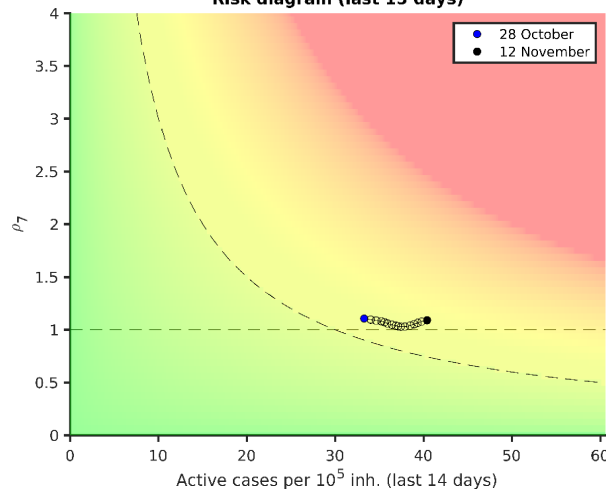
Actual $\rho_7 = 1.1$



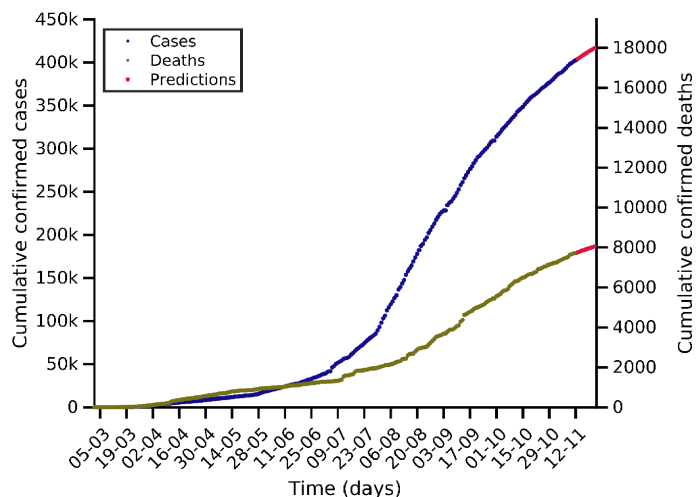
Actual CFR = 4.6 %



Risk diagram (last 15 days)



Philippines 12-11-2020. Pop: 109.6M. Cumulative incidence: 368/10⁵

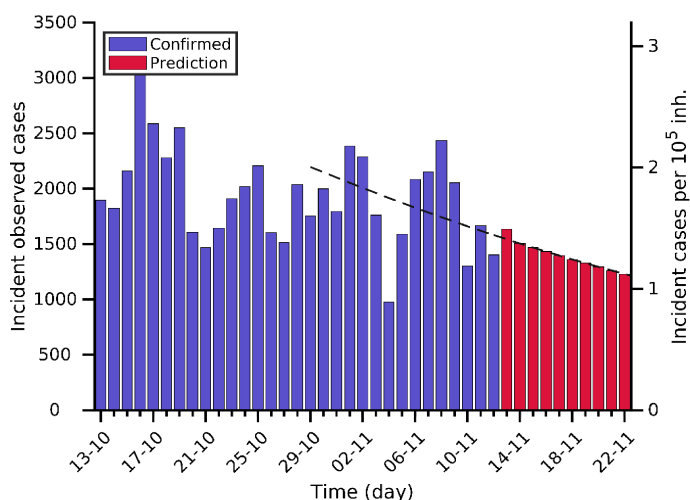


Predictions for next days

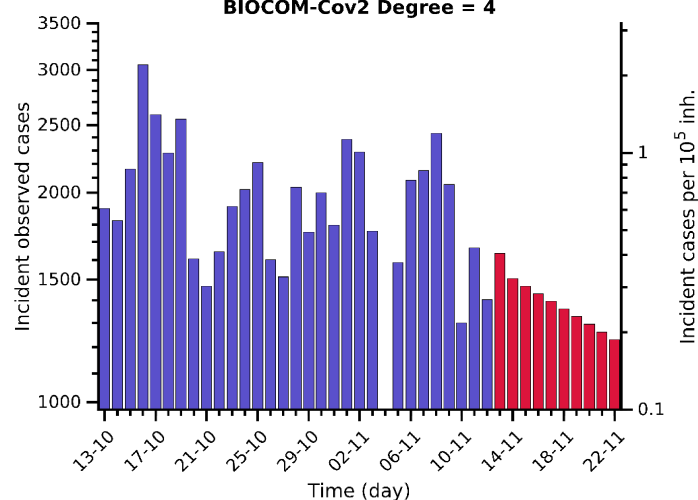
Day	Number of cases	95% Confidence Interval
15-11-2020	407430 (+4610)	[404940 - 409920]
19-11-2020	412948 (+10128)	[408366 - 417530]
22-11-2020	416734 (+13914)	[408996 - 424471]

Current indicators

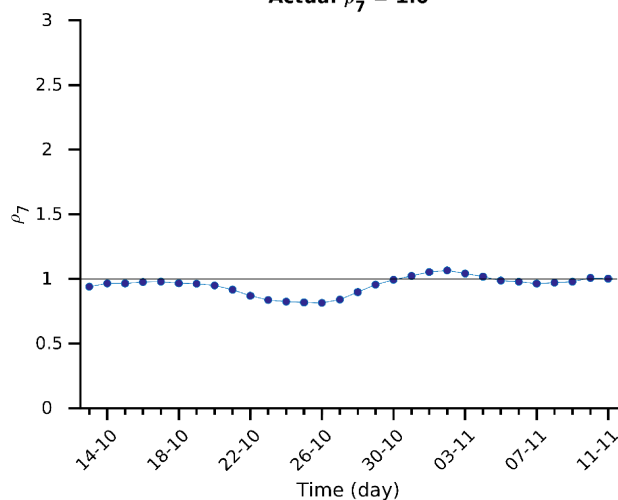
	A14	EPG	CFR	N7	D7
Today	24	24	1.79 %	1871	45
A Week ago	24	24	1.81 %	1827	37
Maximum	55	74	4.92 %	4477	107



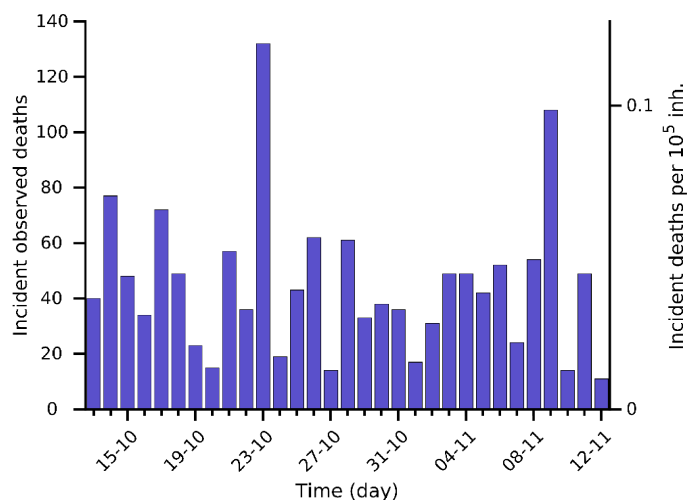
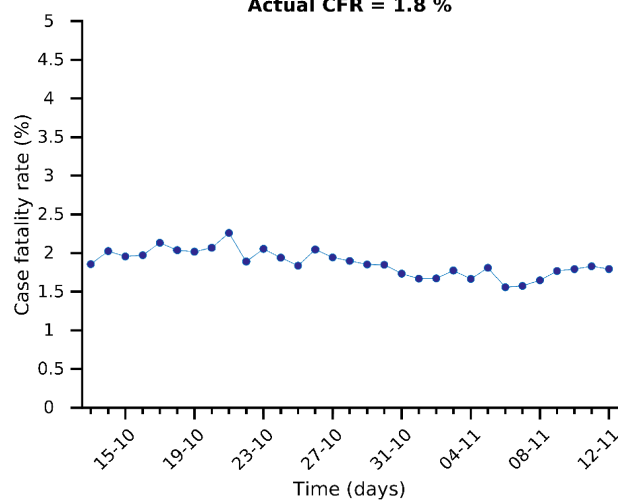
BIOCOM-Cov2 Degree = 4



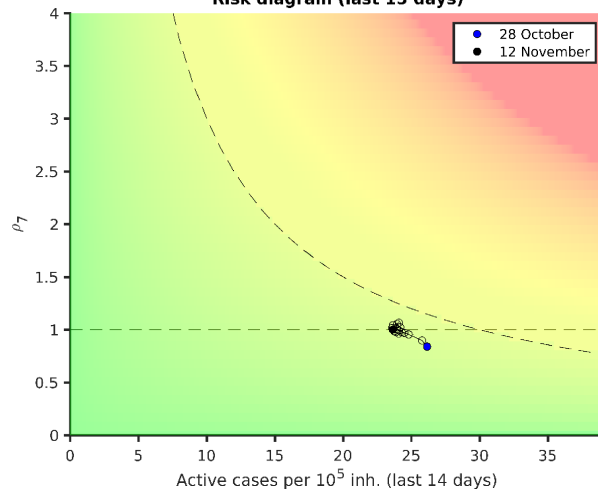
Actual $\rho_7 = 1.0$



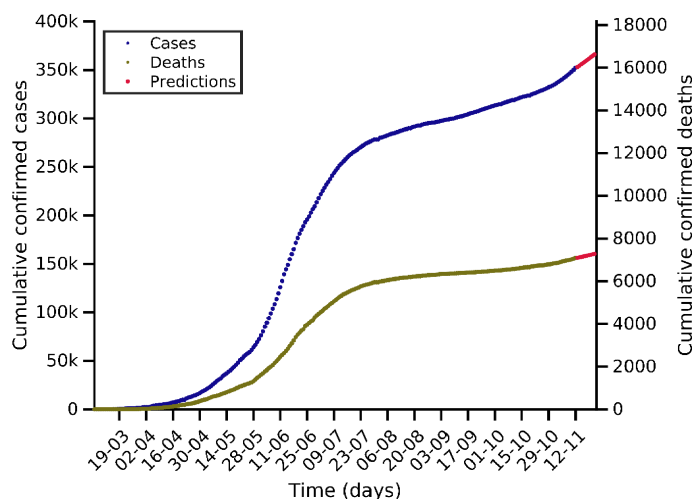
Actual CFR = 1.8 %



Risk diagram (last 15 days)



Pakistan 12-11-2020. Pop: 220.9M. Cumulative incidence: 159/10⁵

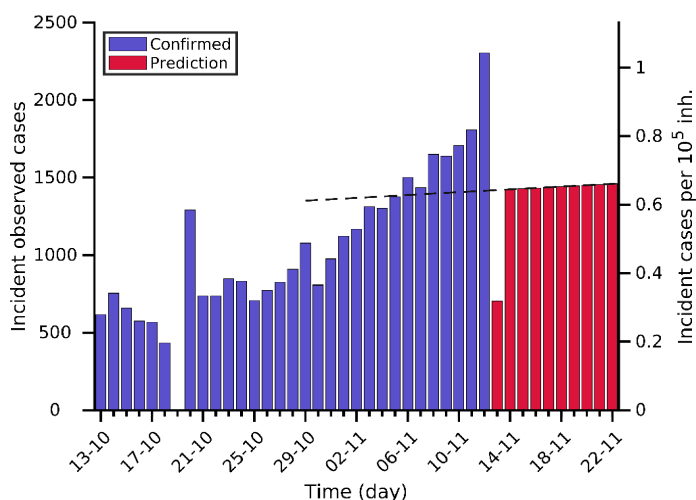


Predictions for next days

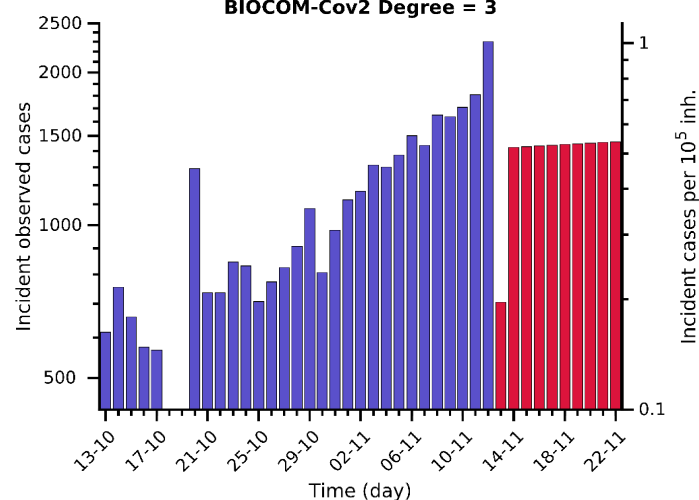
Day	Number of cases	95% Confidence Interval
15-11-2020	355854 (+3558)	[352296 - 366575]
19-11-2020	361613 (+9317)	[352296 - 386582]
22-11-2020	365981 (+13685)	[352296 - 414185]

Current indicators

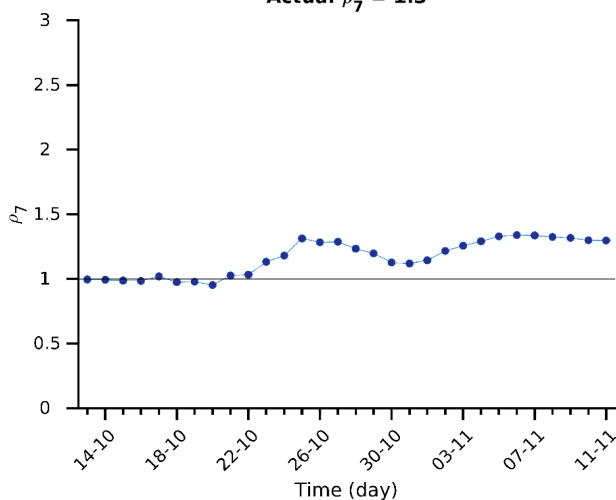
	A14	EPG	CFR	N7	D7
Today	9	12	3.45 %	1721	24
A Week ago	6	8	2.46 %	1152	18
Maximum	35	40	4.90 %	5865	124



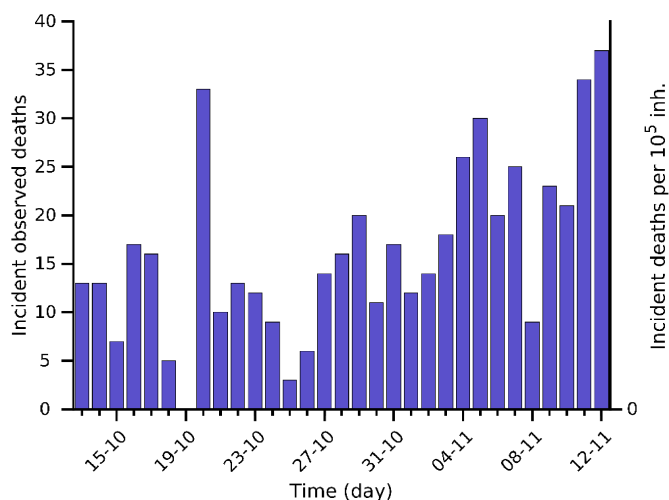
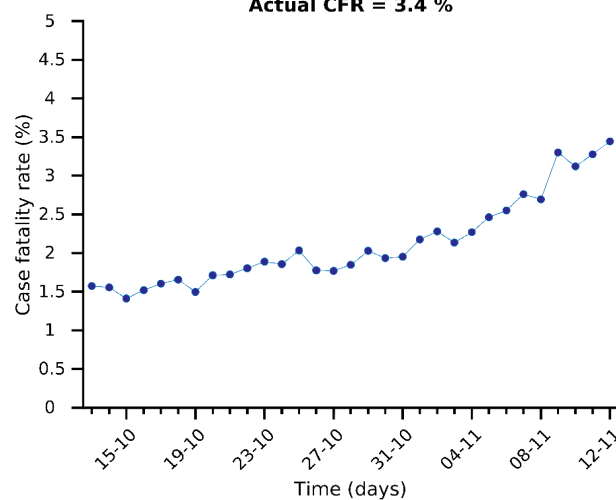
BIOCOM-Cov2 Degree = 3



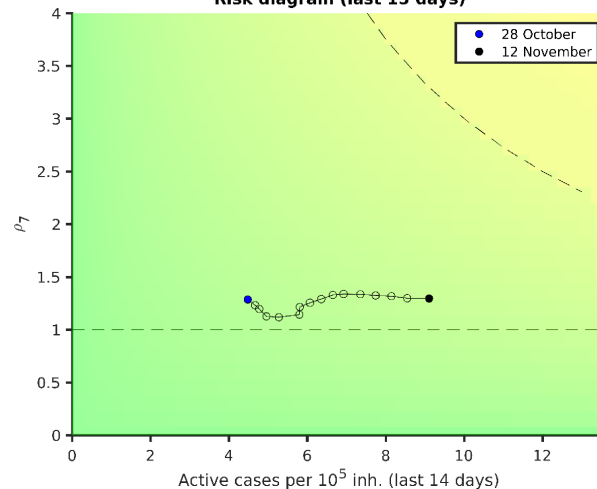
Actual $\rho_7 = 1.3$



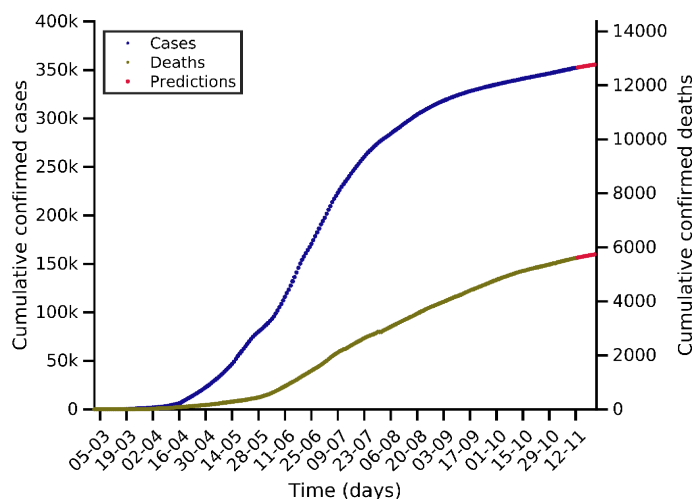
Actual CFR = 3.4 %



Risk diagram (last 15 days)



Saudi Arabia 12-11-2020. Pop: 34.8M. Cumulative incidence: 1012/10⁵

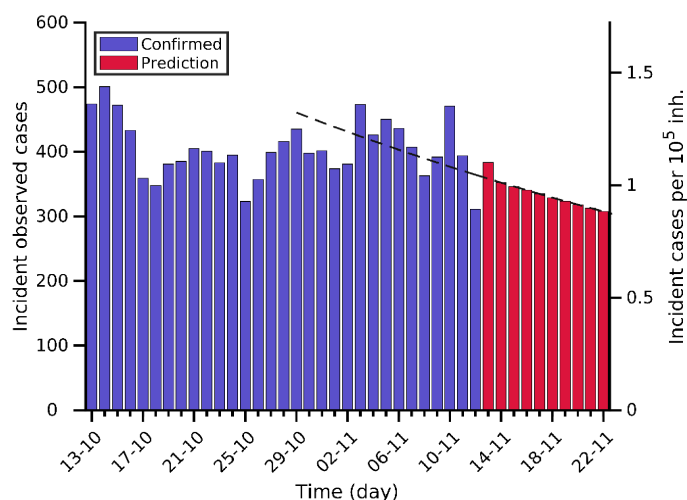


Predictions for next days

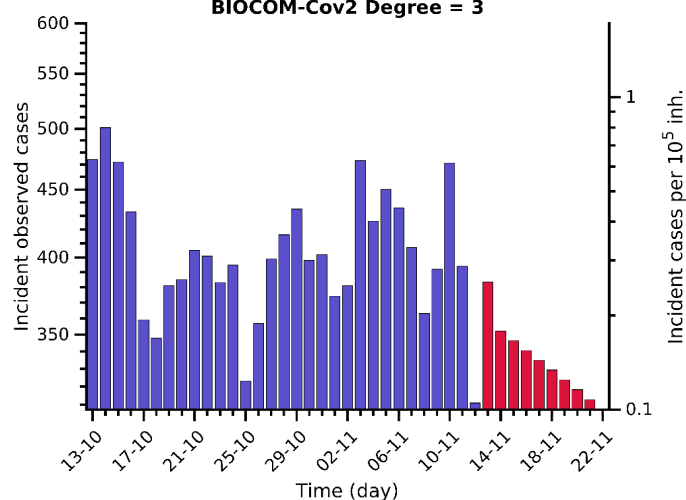
Day	Number of cases	95% Confidence Interval
15-11-2020	353242 (+1082)	[352717 - 353767]
19-11-2020	354570 (+2410)	[353924 - 355216]
22-11-2020	355508 (+3348)	[354715 - 356302]

Current indicators

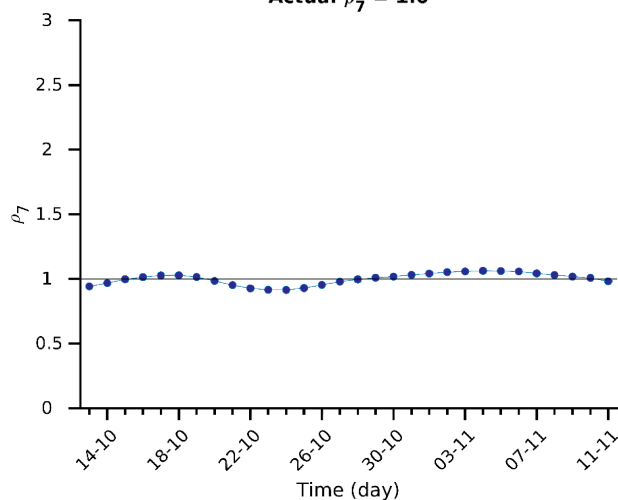
	A14	EPG	CFR	N7	D7
Today	16	16	4.29 %	396	17
A Week ago	16	17	4.01 %	415	18
Maximum	160	189	4.97 %	4418	53



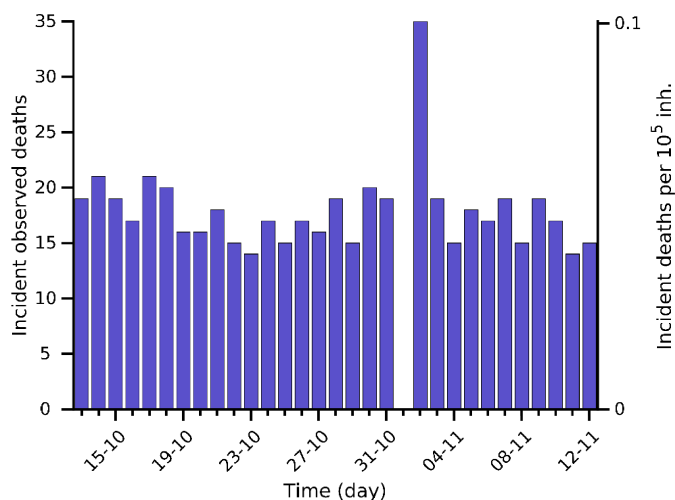
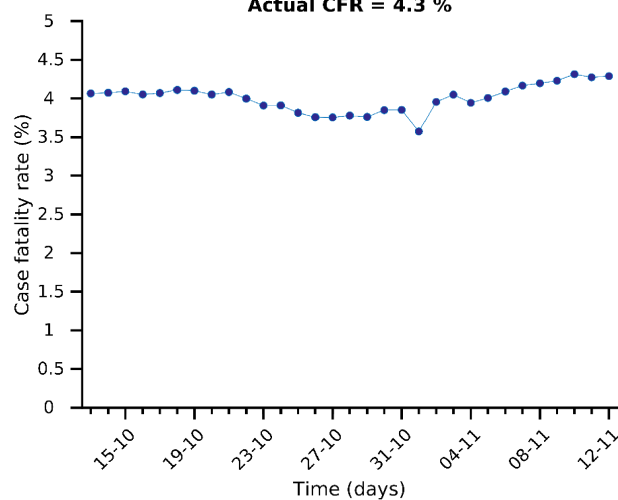
BIOCOM-Cov2 Degree = 3



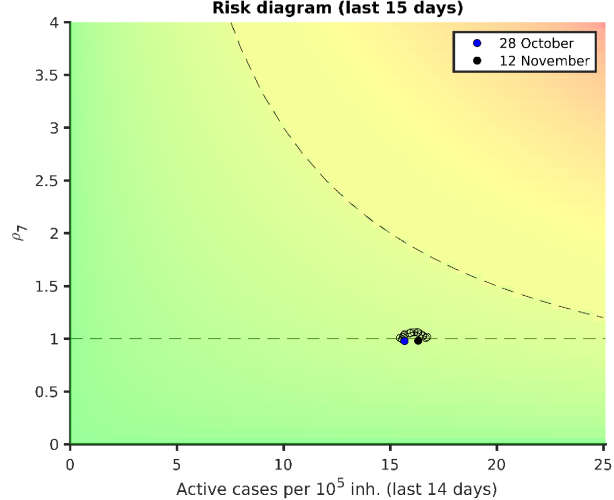
Actual $\rho_7 = 1.0$



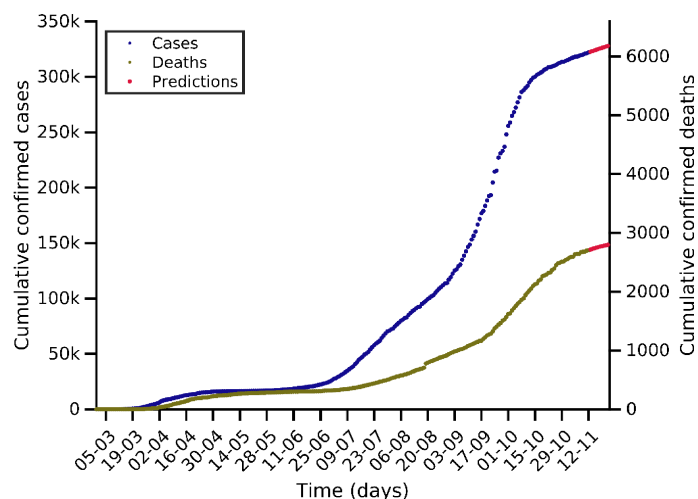
Actual CFR = 4.3 %



Risk diagram (last 15 days)



Israel 12-11-2020. Pop: 8.7M. Cumulative incidence: 3722/10⁵

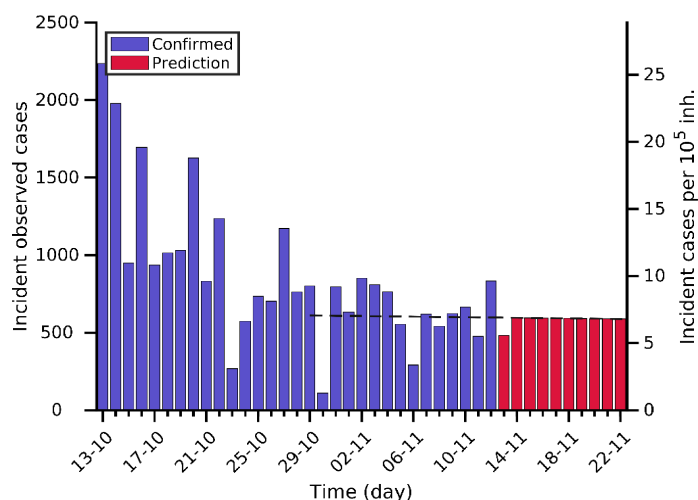


Predictions for next days

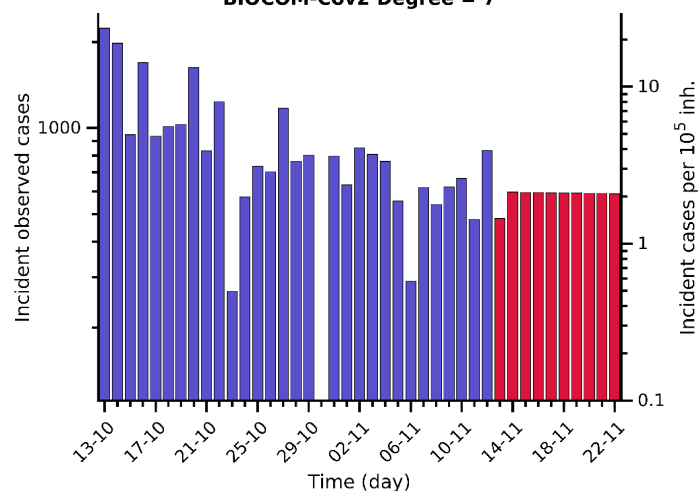
Day	Number of cases	95% Confidence Interval
15-11-2020	323833 (+1674)	[322159 - 325626]
19-11-2020	326204 (+4045)	[323308 - 329101]
22-11-2020	327974 (+5815)	[322685 - 333262]

Current indicators

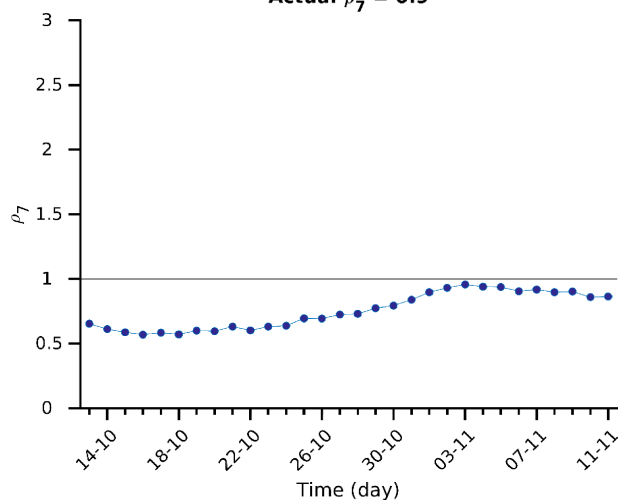
	A14	EPG	CFR	N7	D7
Today	99	86	0.88 %	578	10
A Week ago	110	104	0.72 %	646	18
Maximum	966	1164	4.99 %	6233	39



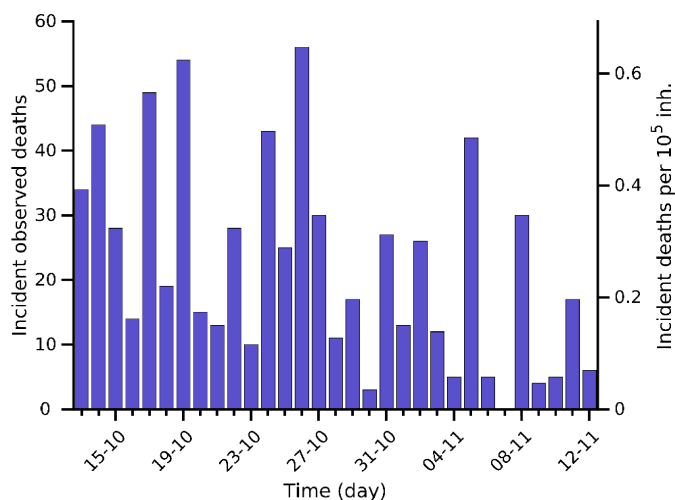
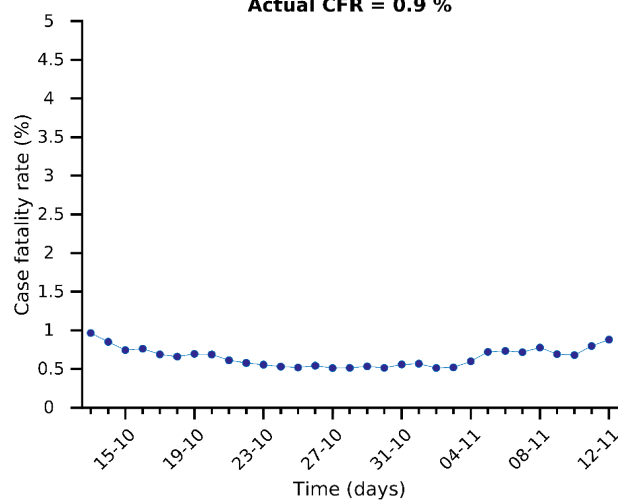
BIOCOM-Cov2 Degree = 7



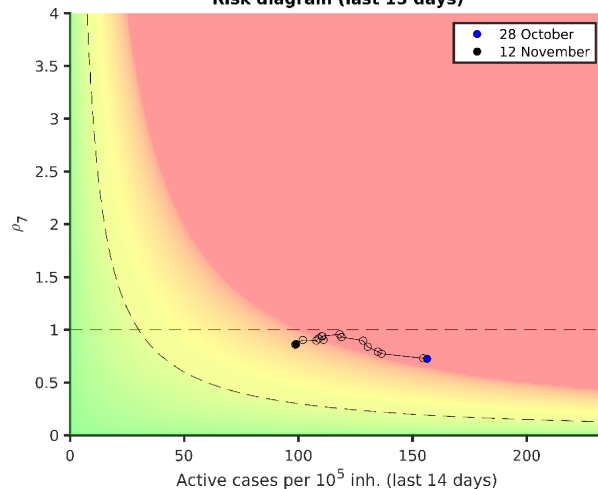
Actual $\rho_7 = 0.9$



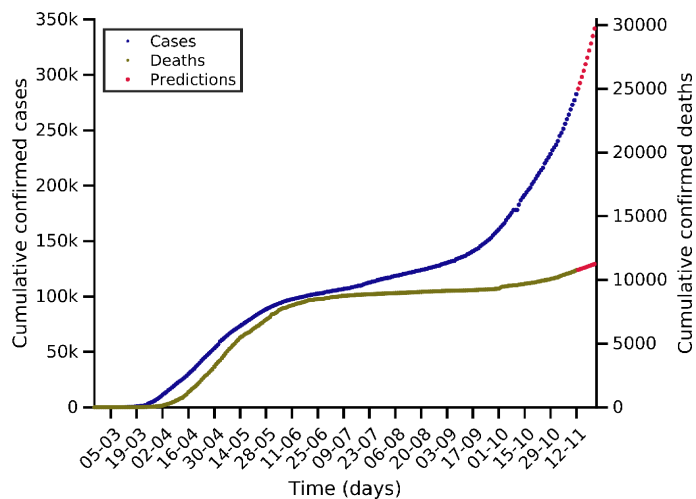
Actual CFR = 0.9 %



Risk diagram (last 15 days)



Canada 12-11-2020. Pop: 37.7M. Cumulative incidence: 749/10⁵

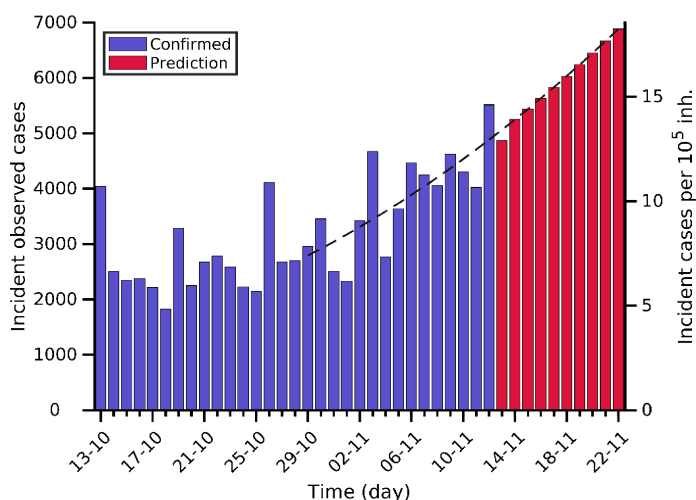


Predictions for next days

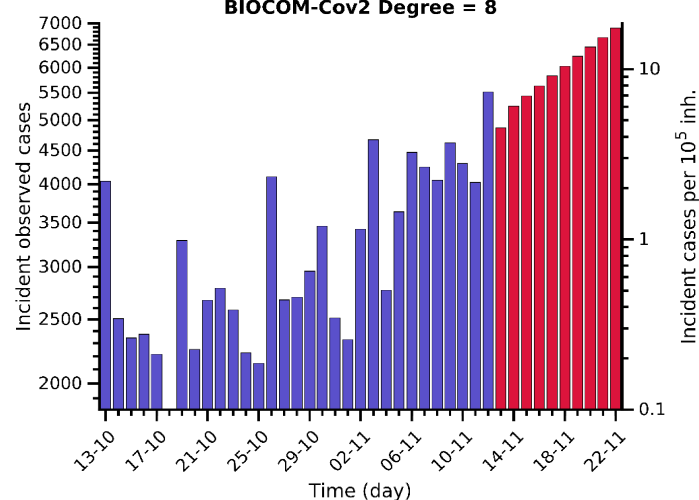
Day	Number of cases	95% Confidence Interval
15-11-2020	298134 (+15557)	[291975 - 304294]
19-11-2020	321870 (+39293)	[304657 - 339084]
22-11-2020	341874 (+59297)	[305431 - 378317]

Current indicators

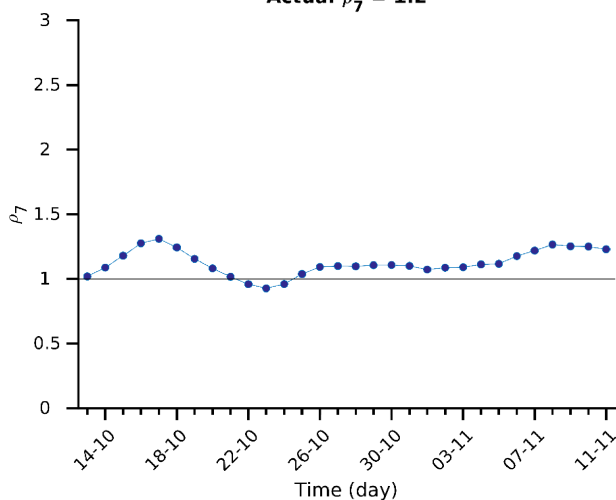
	A14	EPG	CFR	N7	D7
Today	143	176	2.07 %	4463	55
A Week ago	112	124	1.66 %	3257	44
Maximum	143	176	4.96 %	4463	177



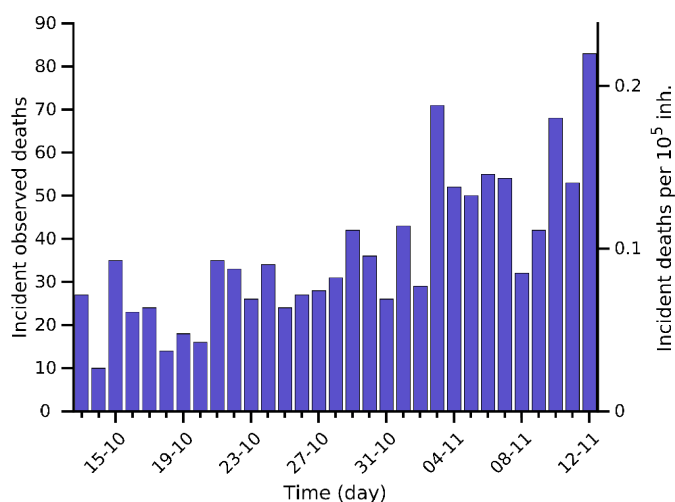
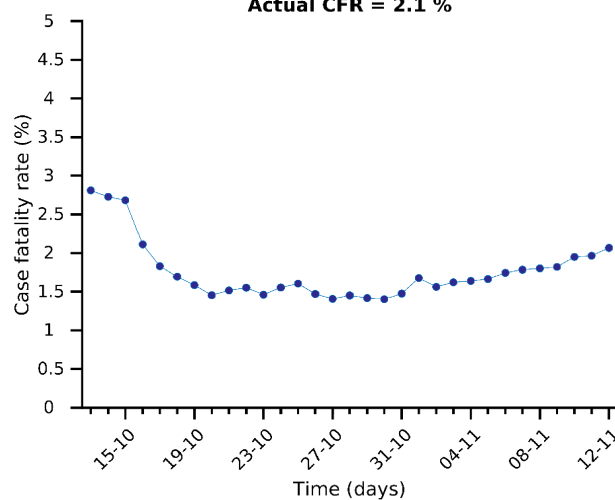
BIOCOM-Cov2 Degree = 8



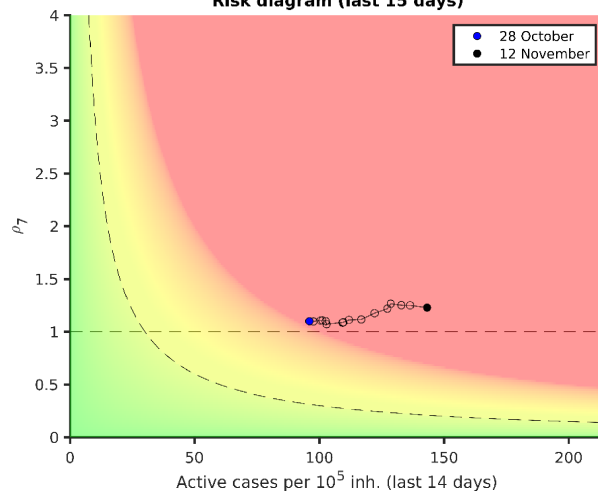
Actual $\rho_7 = 1.2$



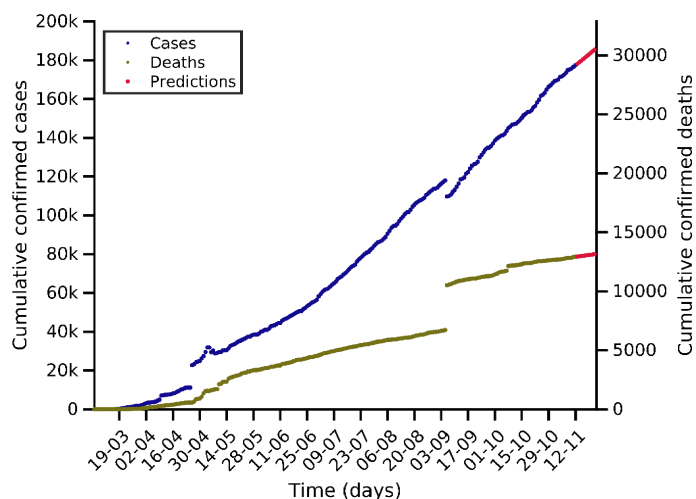
Actual CFR = 2.1 %



Risk diagram (last 15 days)



Ecuador 12-11-2020. Pop: 17.6M. Cumulative incidence: 1006/10⁵

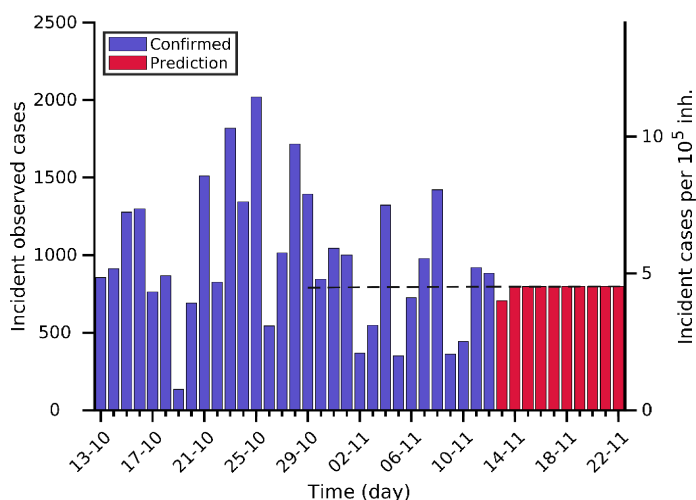


Predictions for next days

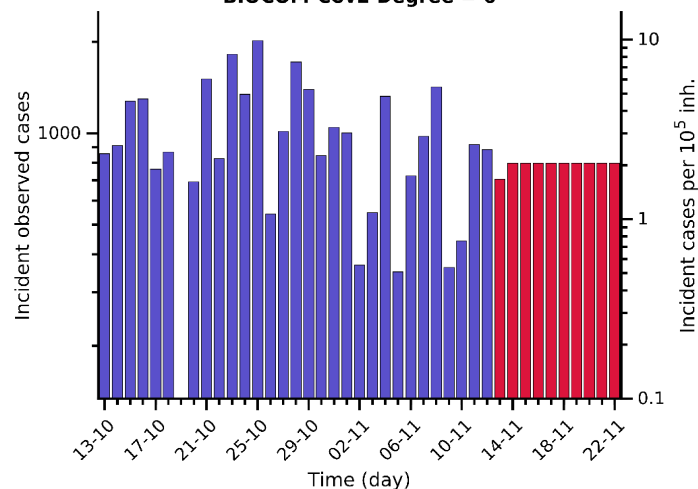
Day	Number of cases	95% Confidence Interval
15-11-2020	179814 (+2301)	[177874 - 181754]
19-11-2020	183005 (+5492)	[178509 - 187502]
22-11-2020	185401 (+7888)	[177513 - 193986]

Current indicators

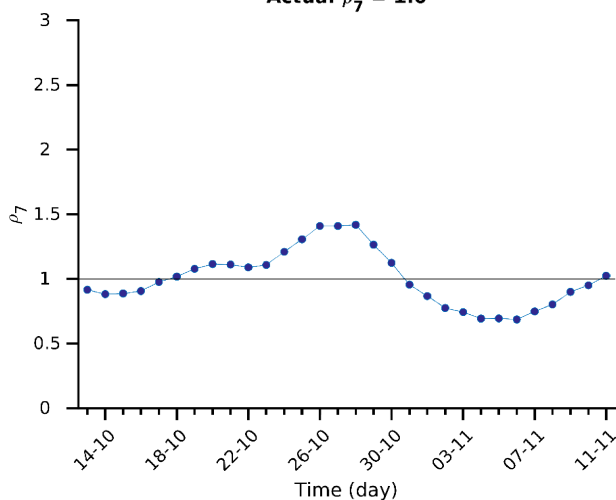
	A14	EPG	CFR	N7	D7
Today	64	65	2.84 %	819	31
A Week ago	87	60	1.95 %	783	15
Maximum	123	500	4.89 %	2326	595



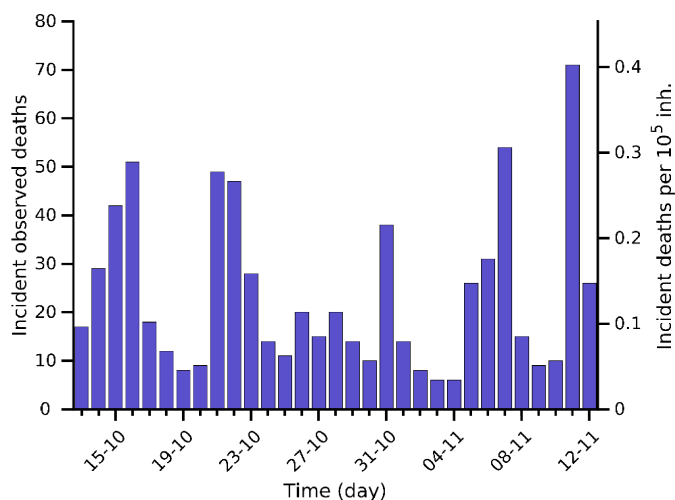
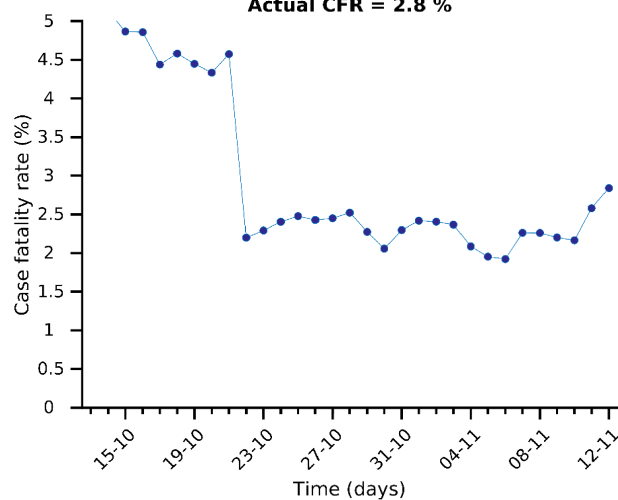
BIOCOM-Cov2 Degree = 6



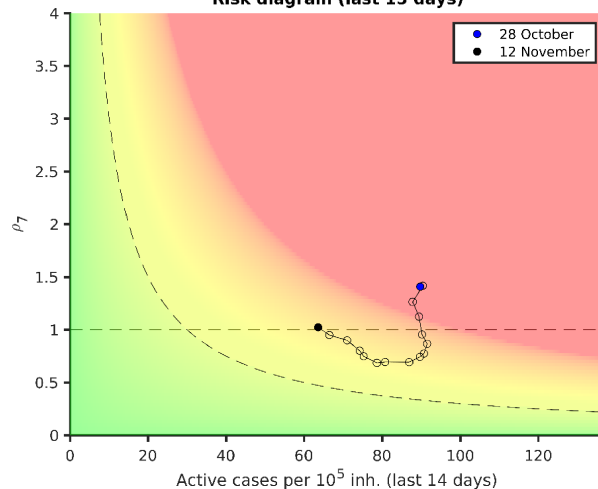
Actual $\rho_7 = 1.0$



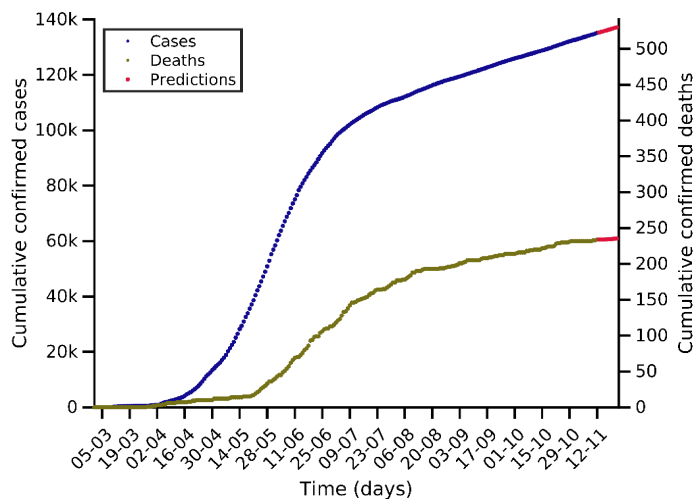
Actual CFR = 2.8 %



Risk diagram (last 15 days)



Qatar 12-11-2020. Pop: 2.9M. Cumulative incidence: 4690/10⁵

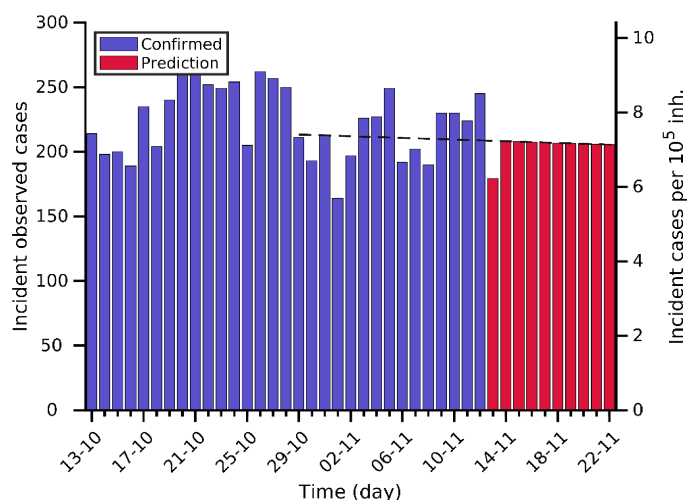


Predictions for next days

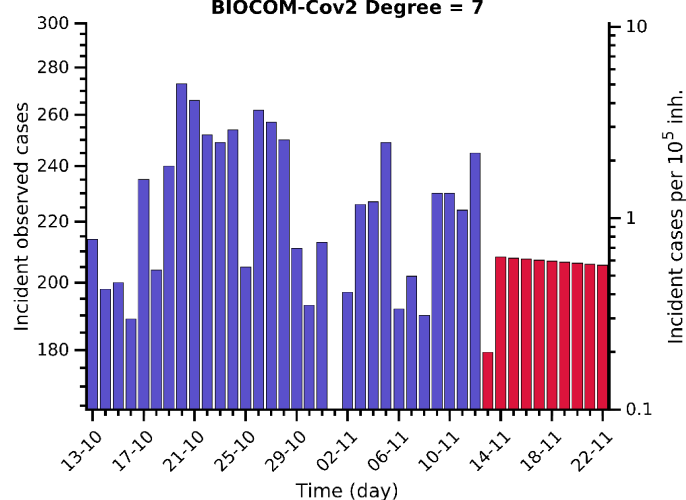
Day	Number of cases	95% Confidence Interval
15-11-2020	135727 (+595)	[135347 - 136108]
19-11-2020	136555 (+1423)	[136015 - 137096]
22-11-2020	137173 (+2041)	[136419 - 137927]

Current indicators

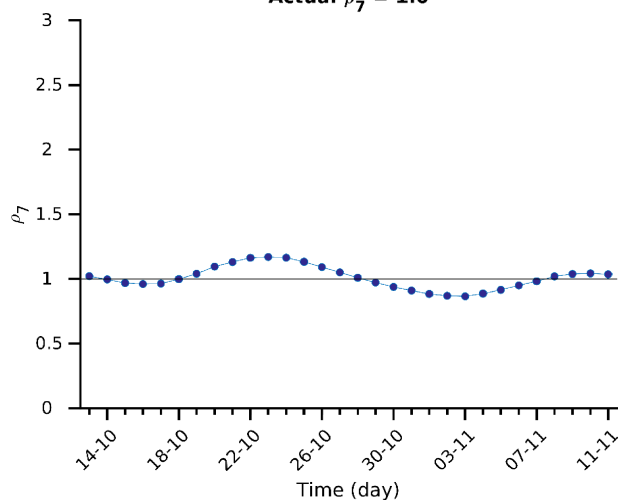
	A14	EPG	CFR	N7	D7
Today	104	107	0.10 %	216	0
A Week ago	110	97	0.14 %	210	0
Maximum	871	954	1.98 %	1888	4



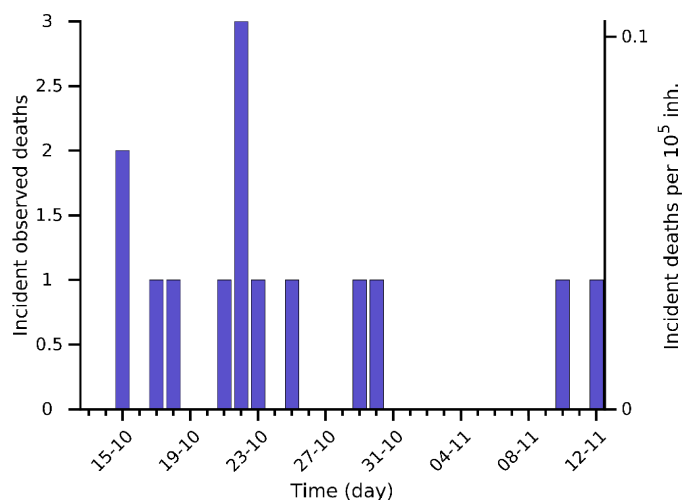
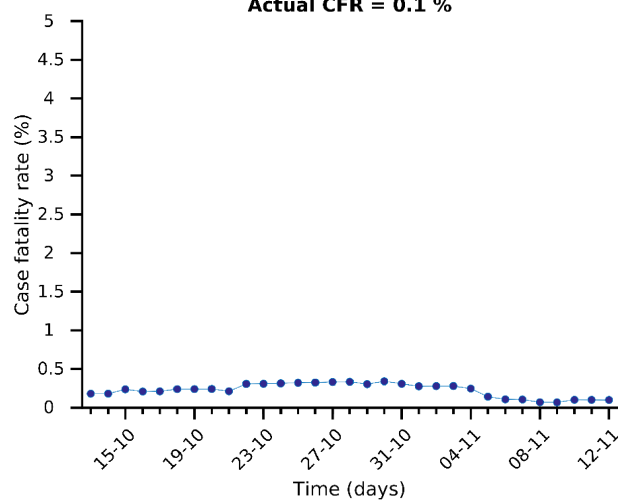
BIOCOM-Cov2 Degree = 7



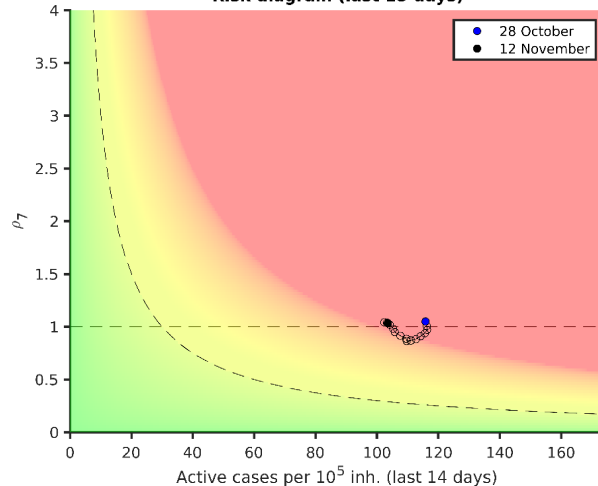
Actual $\rho_7 = 1.0$



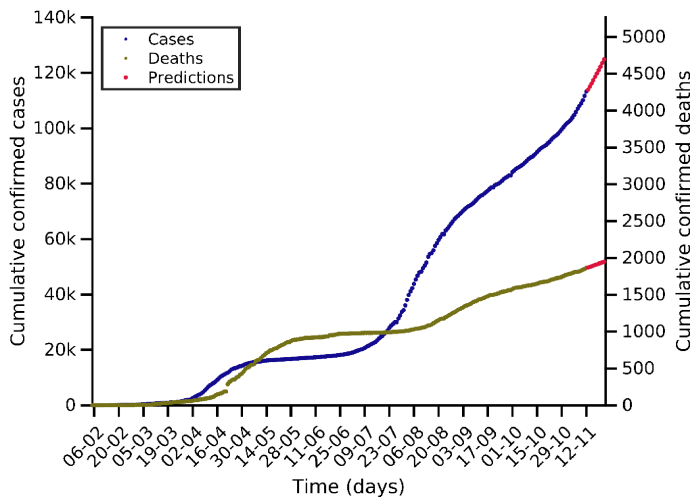
Actual CFR = 0.1 %



Risk diagram (last 15 days)



Japan 12-11-2020. Pop: 126.5M. Cumulative incidence: 90/10⁵

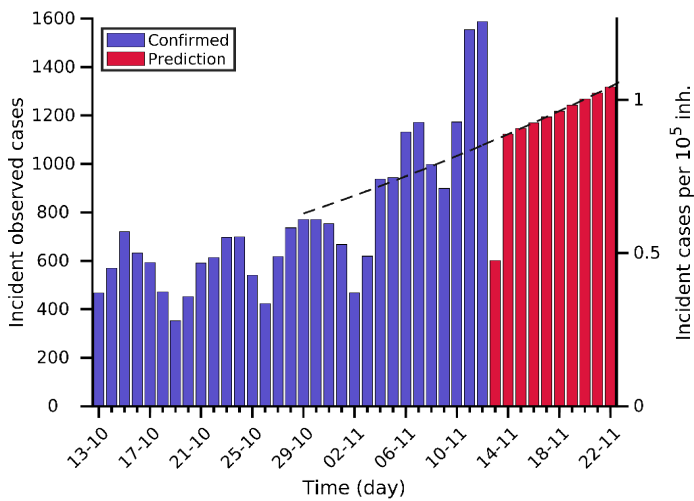


Predictions for next days

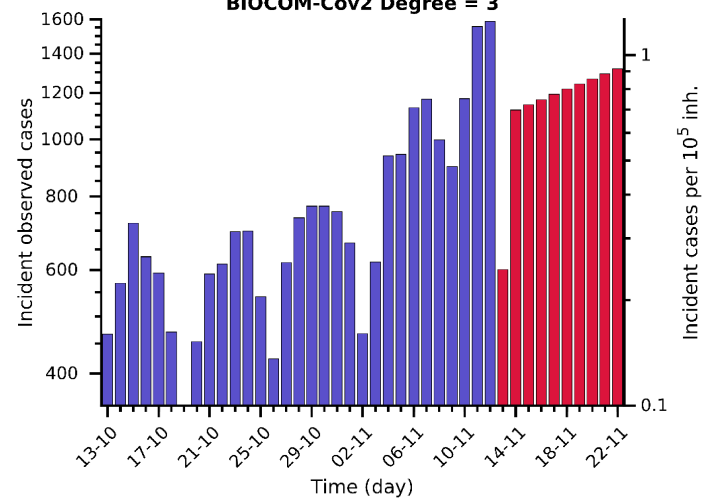
Day	Number of cases	95% Confidence Interval
15-11-2020	116168 (+2870)	[113298 - 124191]
19-11-2020	120993 (+7695)	[113298 - 141518]
22-11-2020	124872 (+11574)	[113298 - 166666]

Current indicators

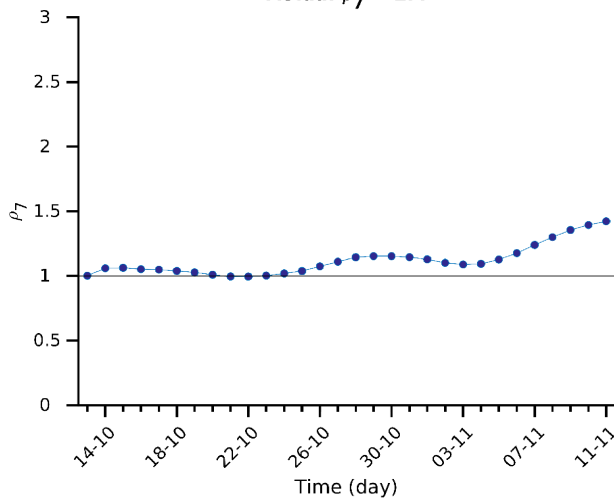
	A14	EPG	CFR	N7	D7
Today	11	15	1.64 %	1217	9
A Week ago	8	8	1.55 %	737	9
Maximum	15	21	4.97 %	1581	29



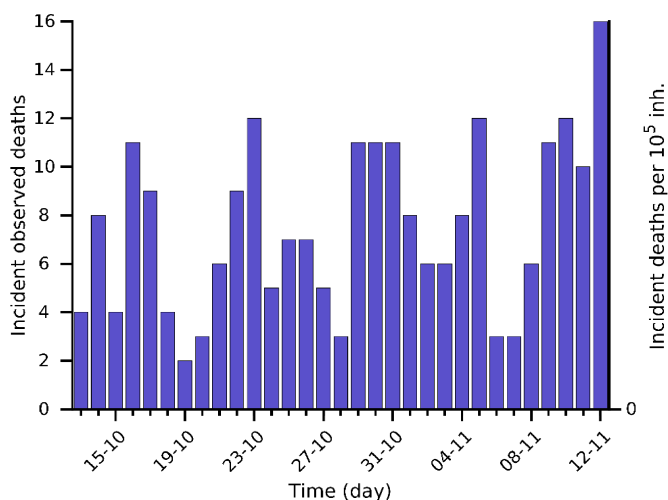
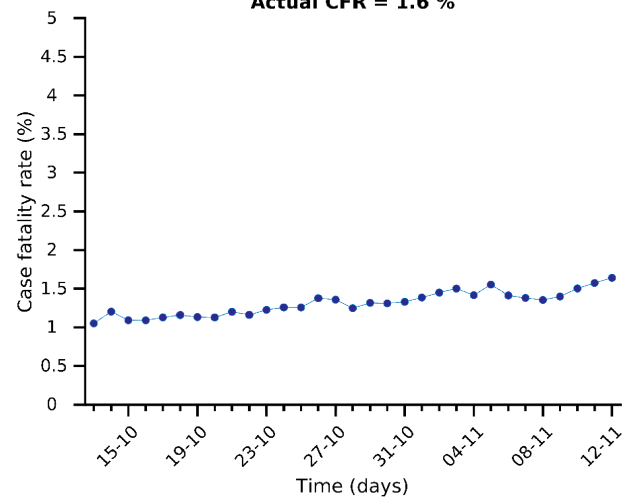
BIOCOM-Cov2 Degree = 3



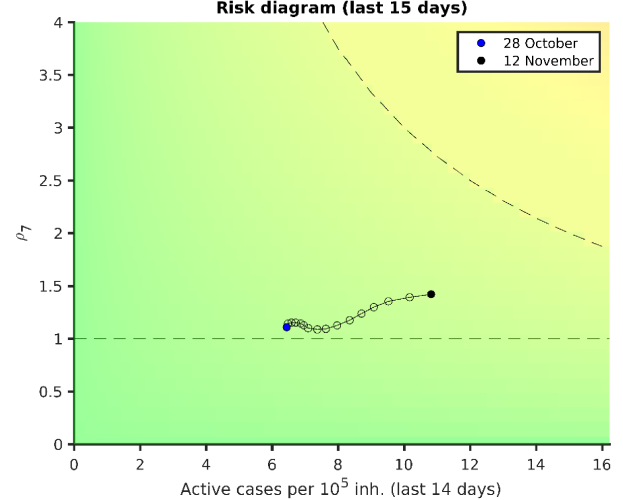
Actual $\rho_7 = 1.4$



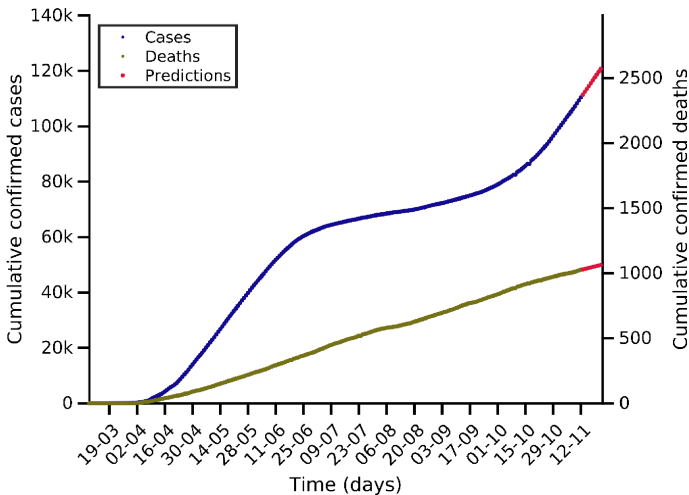
Actual CFR = 1.6 %



Risk diagram (last 15 days)

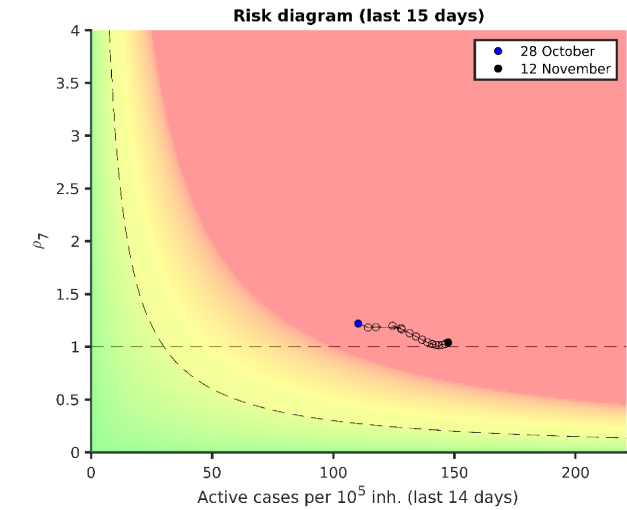
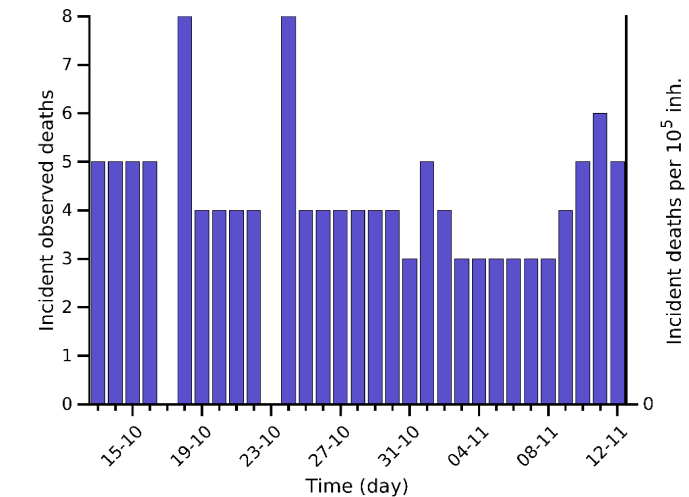
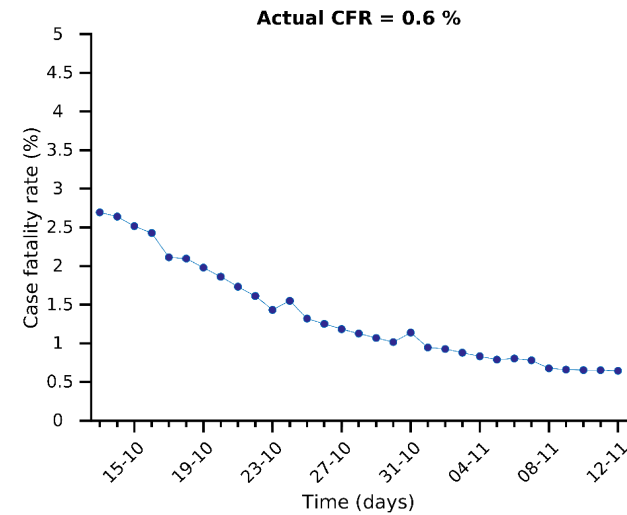
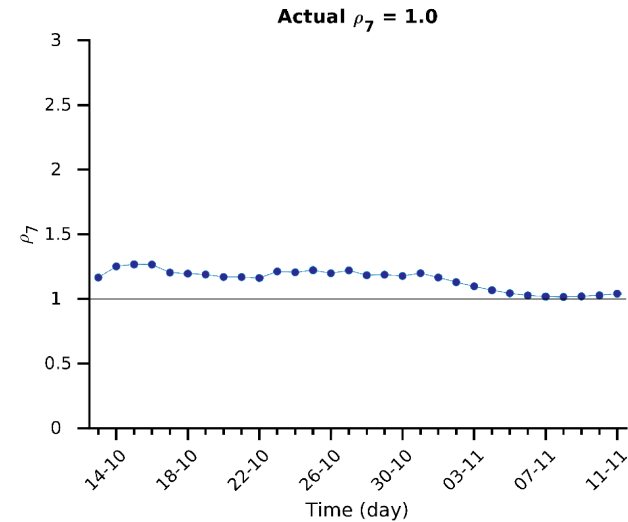
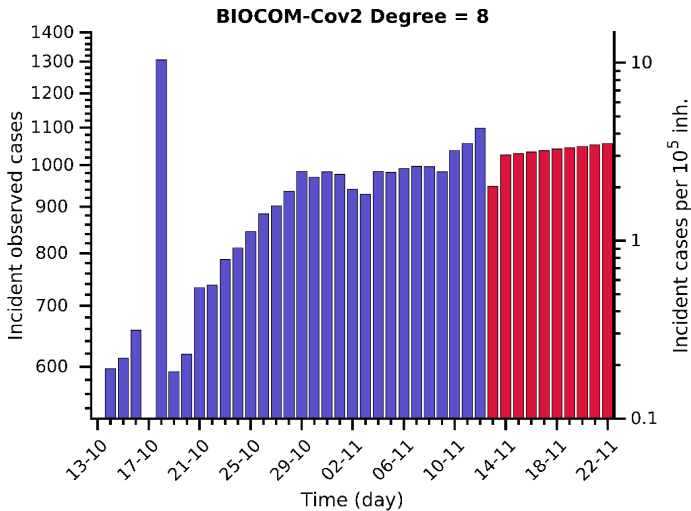
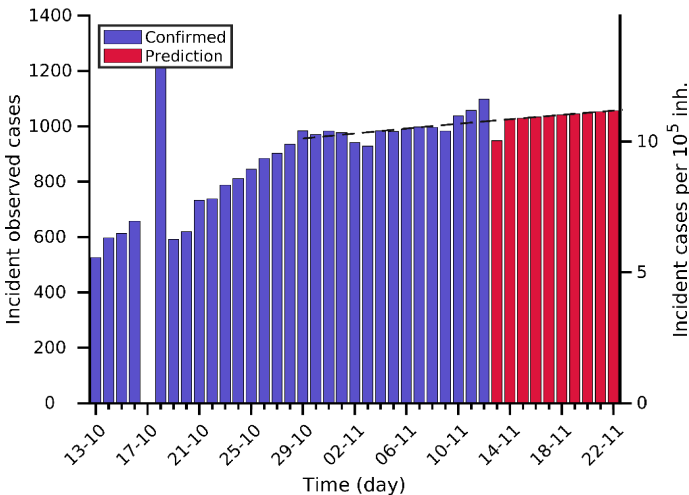


Belarus 12-11-2020. Pop: 9.4M. Cumulative incidence: 1169/10⁵

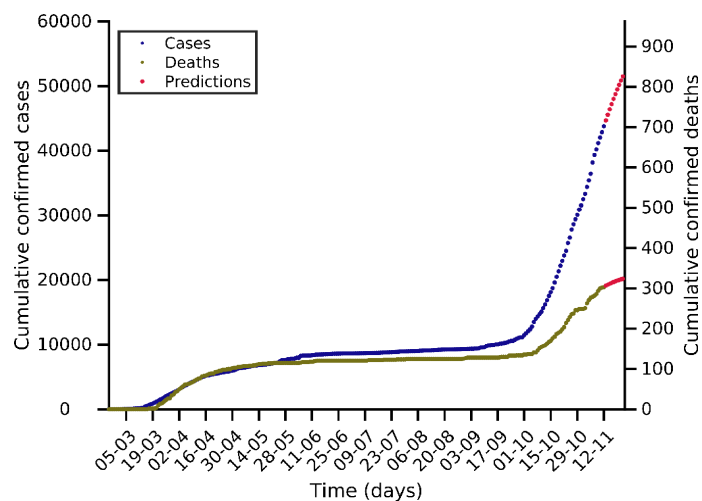


Predictions for next days		
Day	Number of cases	95% Confidence Interval
15-11-2020	113458 (+3003)	[112505 - 114411]
19-11-2020	117616 (+7161)	[115433 - 119798]
22-11-2020	120774 (+10319)	[116578 - 124970]

Current indicators					
	A14	EPG	CFR	N7	D7
Today	147	153	0.64 %	1023	4
A Week ago	137	146	0.79 %	967	4
Maximum	147	153	4.92 %	1023	6



Malaysia 12-11-2020. Pop: 32.4M. Cumulative incidence: 135/10⁵

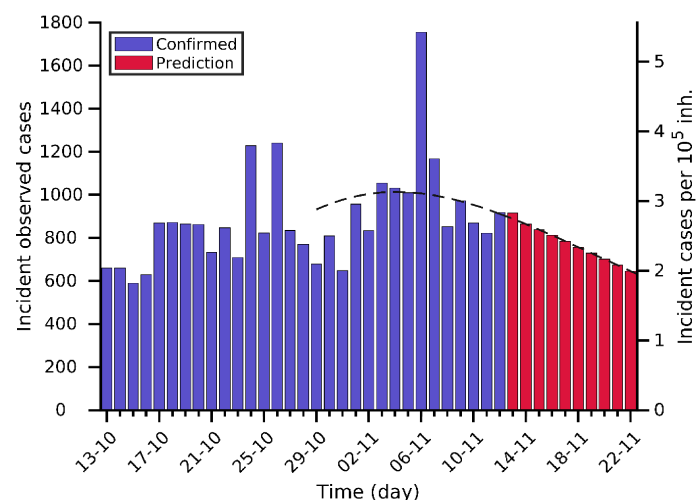


Predictions for next days

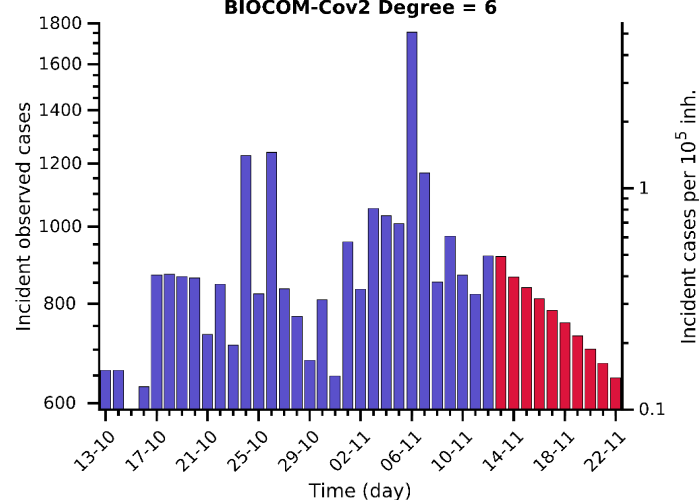
Day	Number of cases	95% Confidence Interval
15-11-2020	46410 (+2619)	[44664 - 48157]
19-11-2020	49493 (+5702)	[46535 - 52452]
22-11-2020	51514 (+7723)	[46867 - 56160]

Current indicators

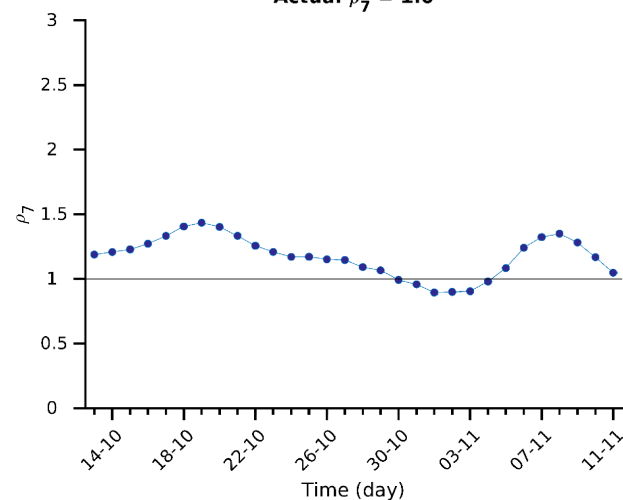
	A14	EPG	CFR	N7	D7
Today	42	44	0.60 %	1051	4
A Week ago	39	38	1.10 %	906	4
Maximum	42	56	4.98 %	1120	7



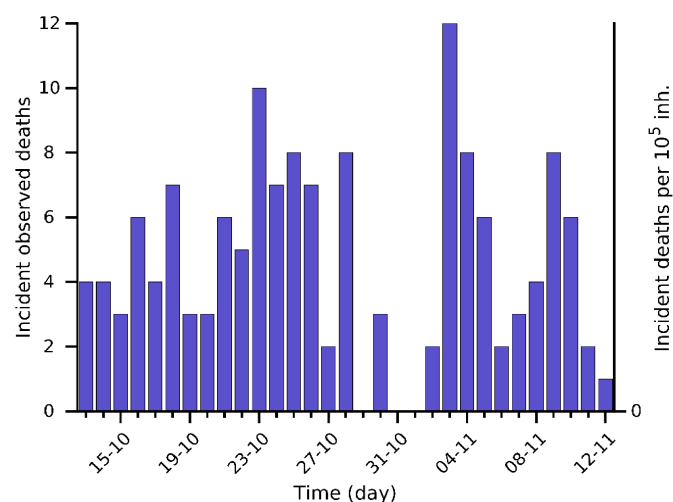
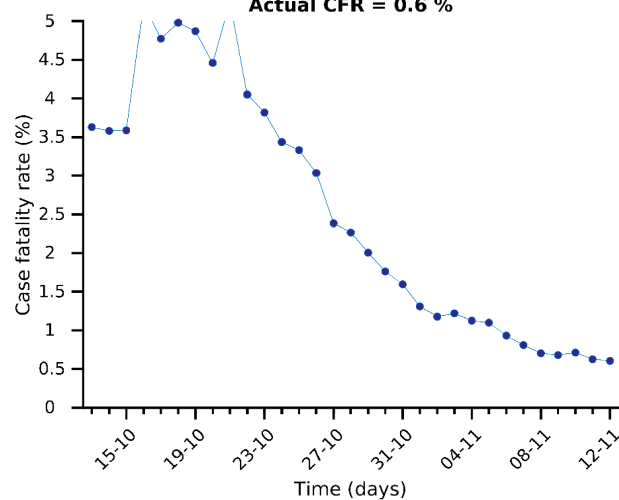
BIOCOM-Cov2 Degree = 6



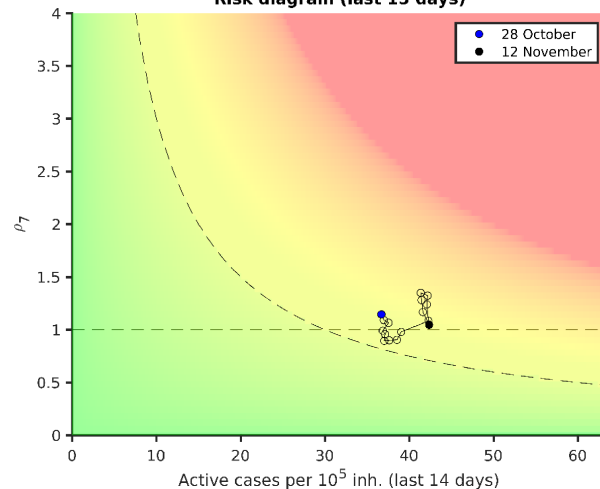
Actual $\rho_7 = 1.0$



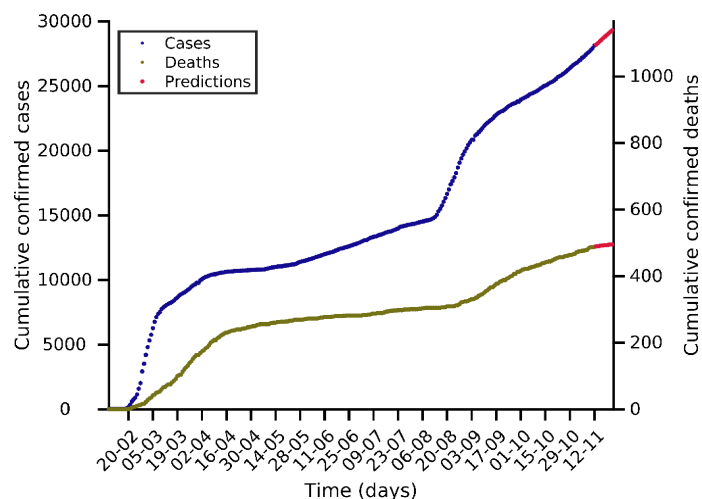
Actual CFR = 0.6 %



Risk diagram (last 15 days)



South Korea 12-11-2020. Pop: 51.3M. Cumulative incidence: 55/10⁵

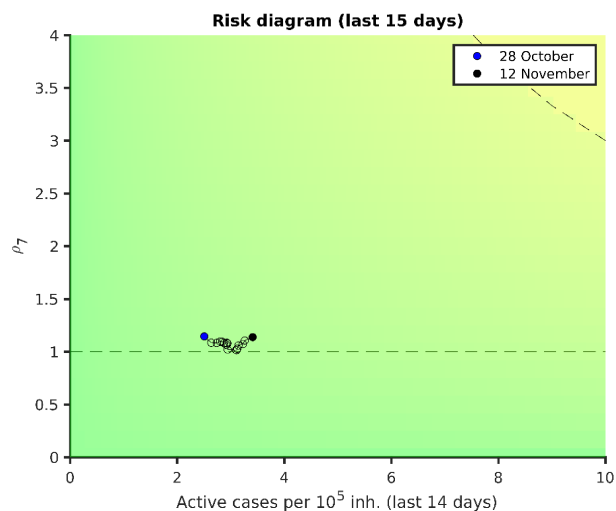
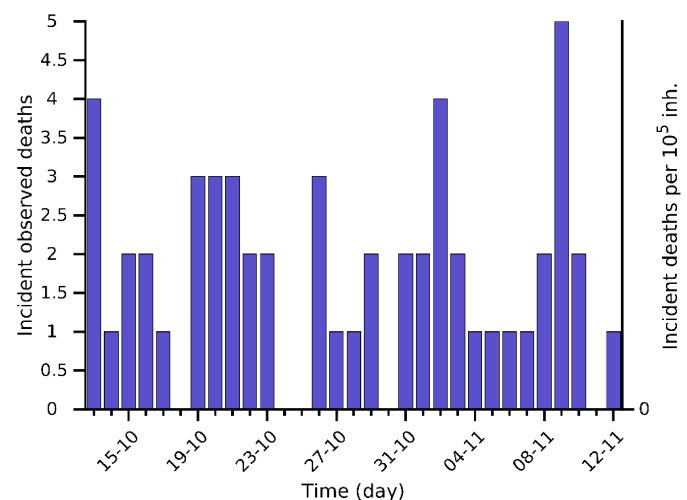
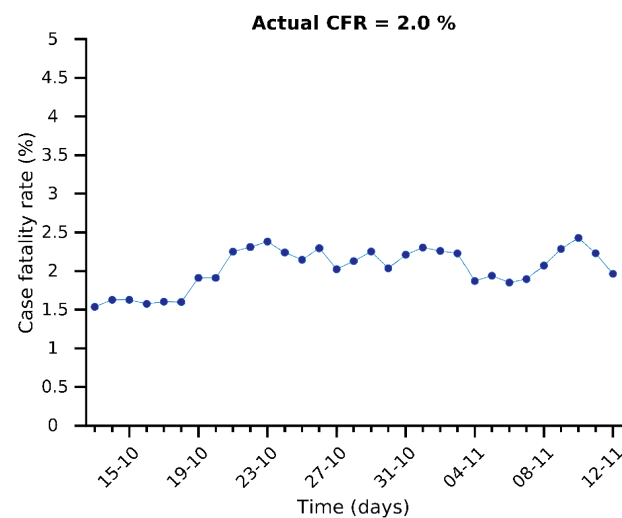
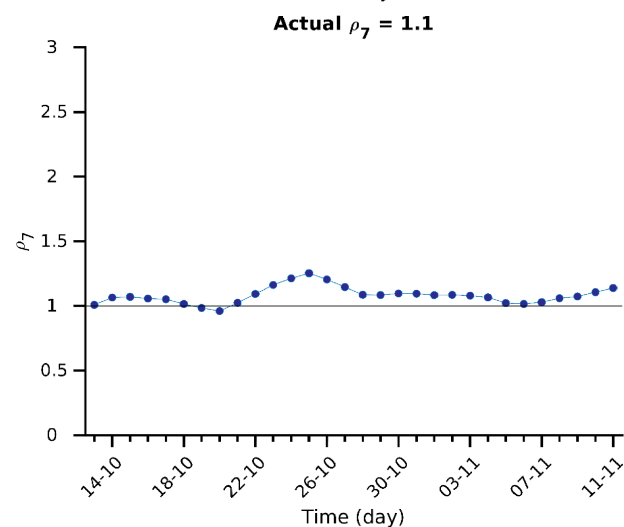
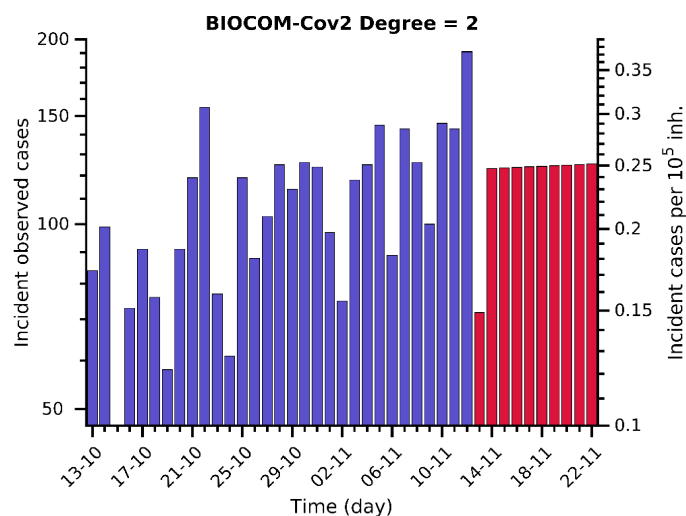
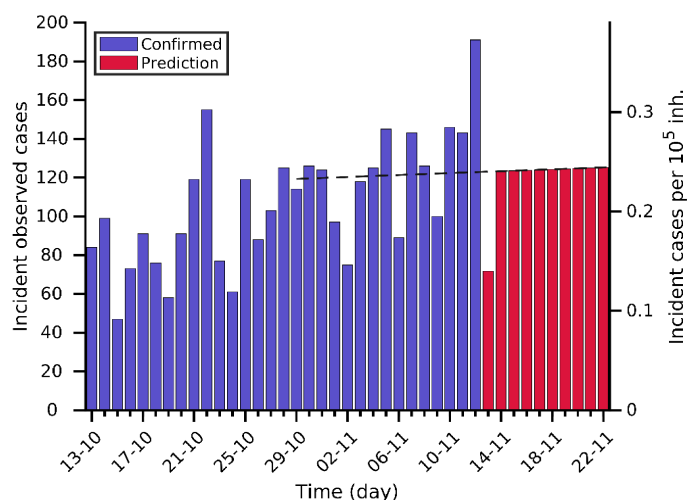


Predictions for next days

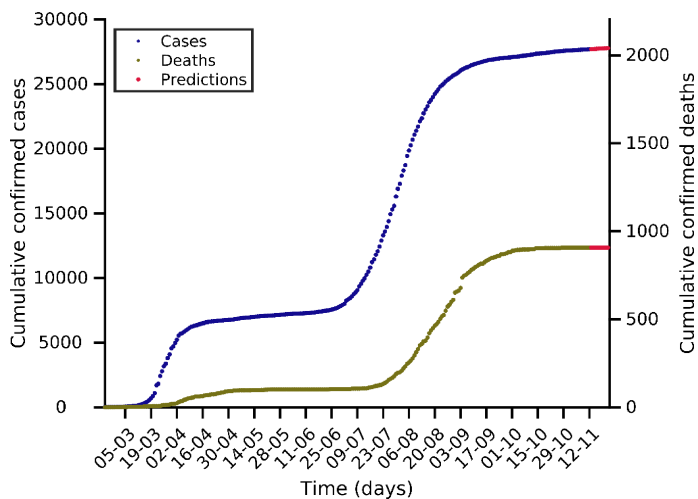
Day	Number of cases	95% Confidence Interval
15-11-2020	28452 (+319)	[28133 - 29159]
19-11-2020	28949 (+816)	[28133 - 30585]
22-11-2020	29324 (+1191)	[28133 - 32468]

Current indicators

	A14	EPG	CFR	N7	D7
Today	3	4	1.96 %	134	2
A Week ago	3	3	1.94 %	116	2
Maximum	13	114	4.98 %	609	7



Australia 12-11-2020. Pop: 25.5M. Cumulative incidence: 109/10⁵

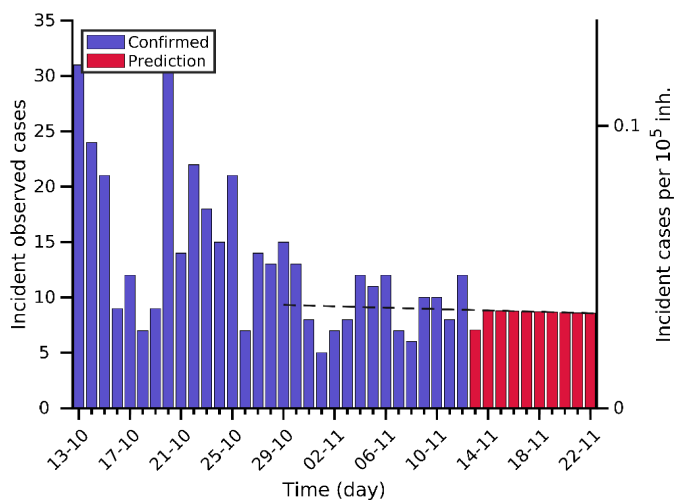


Predictions for next days

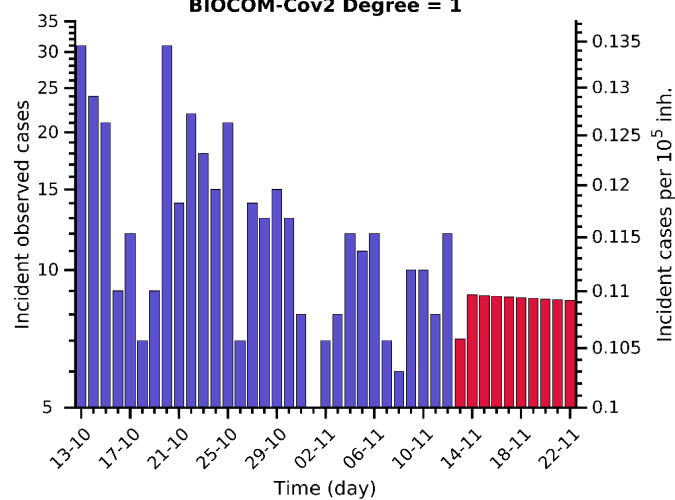
Day	Number of cases	95% Confidence Interval
15-11-2020	27723 (+25)	[27700 - 27746]
19-11-2020	27758 (+60)	[27729 - 27786]
22-11-2020	27783 (+85)	[27746 - 27821]

Current indicators

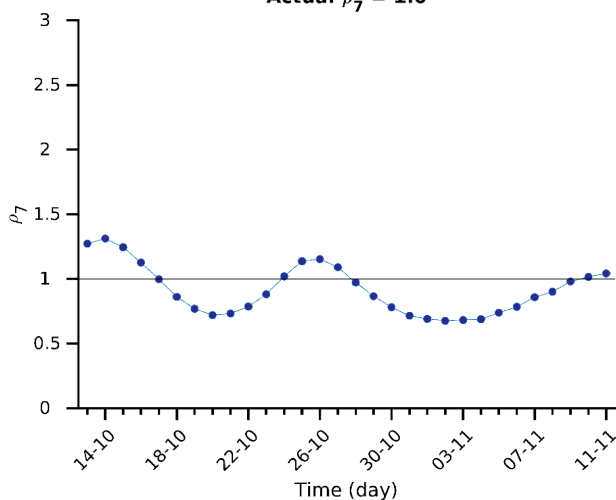
	A14	EPG	CFR	N7	D7
Today	1	1	0.00 %	9	0
A Week ago	1	0	0.75 %	9	0
Maximum	26	38	5.00 %	552	22



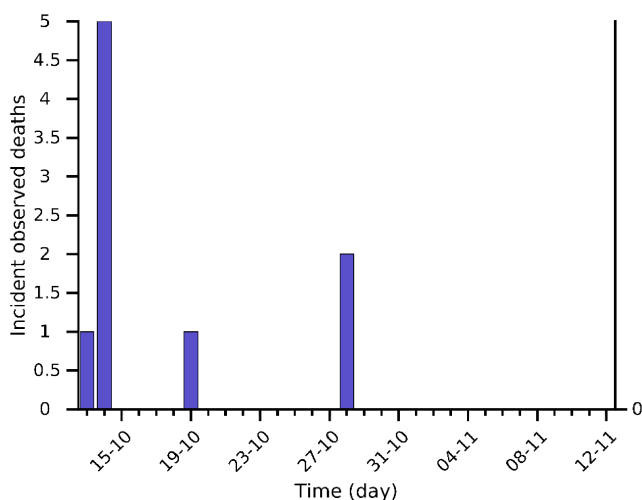
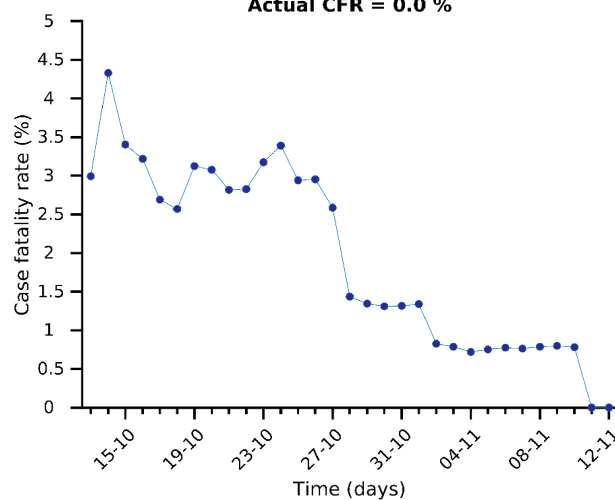
BIOCOM-Cov2 Degree = 1



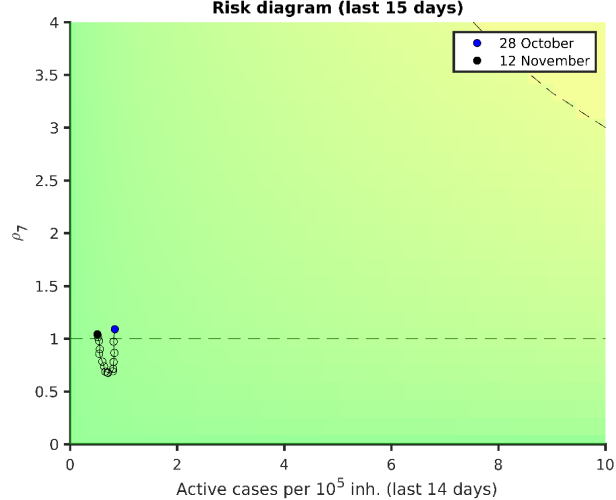
Actual $\rho_7 = 1.0$



Actual CFR = 0.0 %

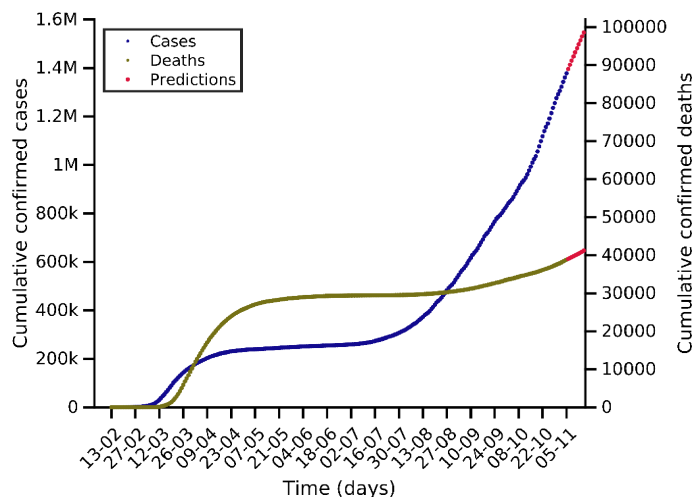


Risk diagram (last 15 days)



(4) Analysis and prediction of COVID-19 for Spain and its regions

Spain 05-11-2020. Pop: 47.0M. Cumulative incidence: 2931/10⁵

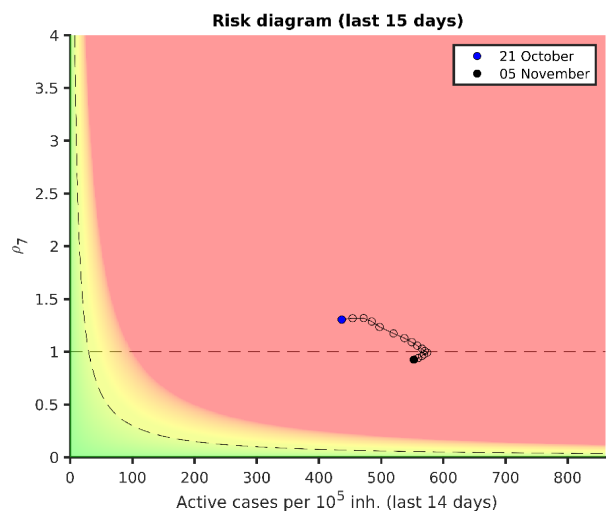
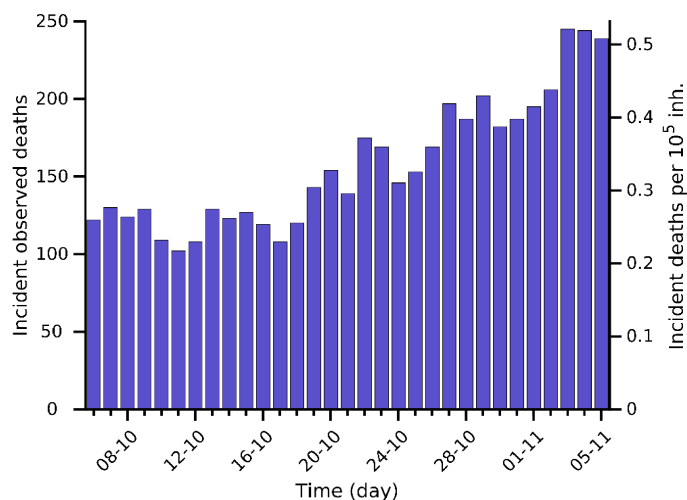
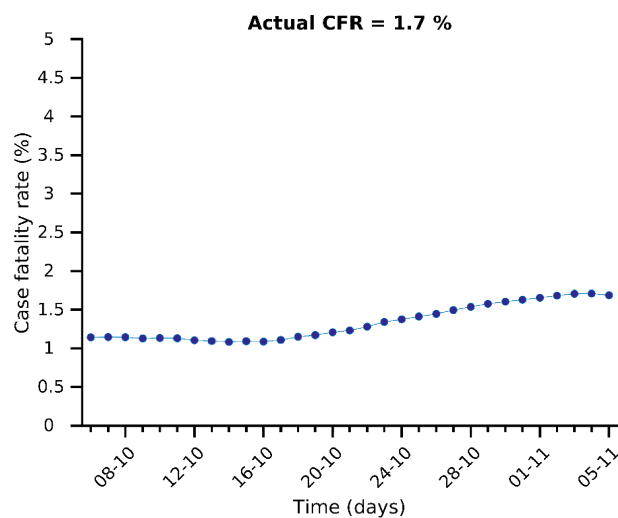
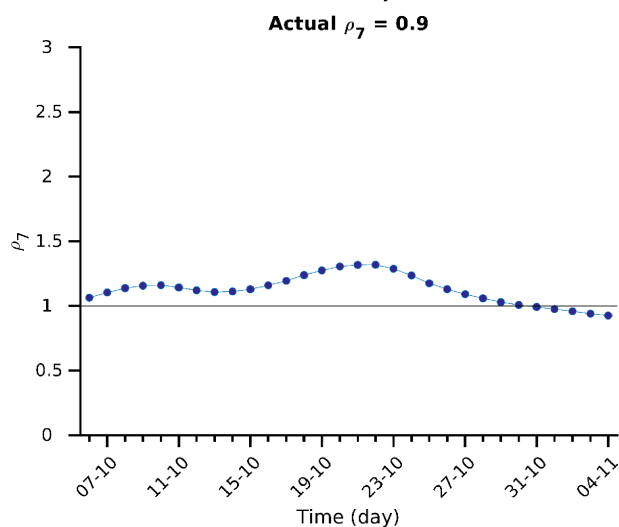
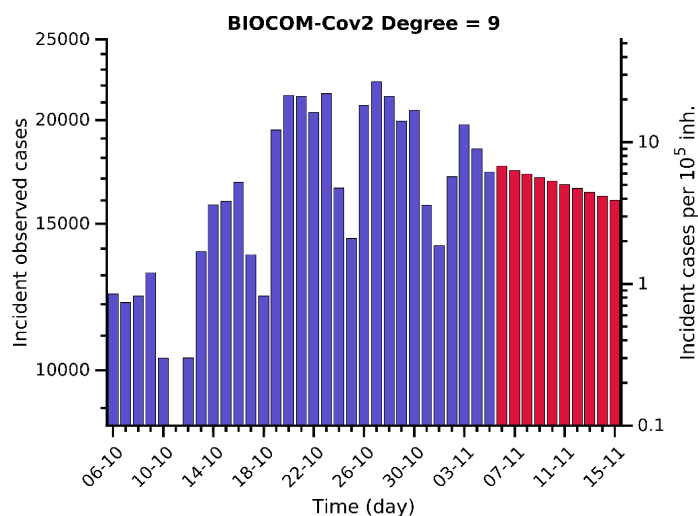
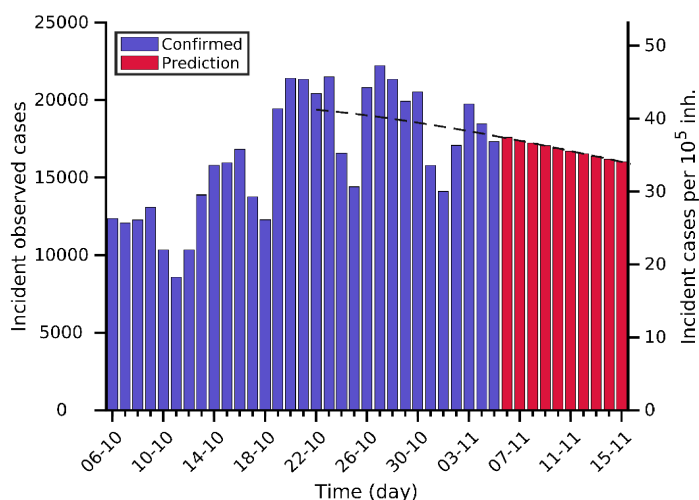


Predictions for next days

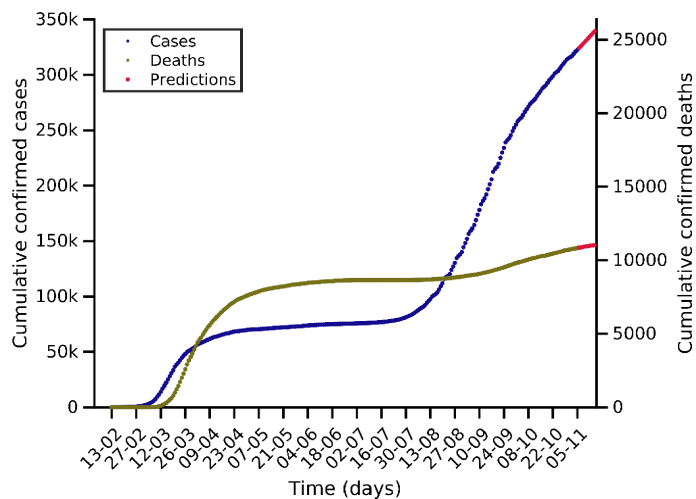
Day	Number of cases	95% Confidence Interval
08-11-2020	1430459 (+52206)	[1418436 - 1442482]
12-11-2020	1497659 (+119406)	[1472254 - 1523064]
15-11-2020	1546233 (+167980)	[1500449 - 1592018]

Current indicators

	A14	EPG	CFR	N7	D7
Today	553	511	1.69 %	17580	214
A Week ago	558	590	1.58 %	19542	175
Maximum	574	624	4.66 %	19613	867



Madrid 05-11-2020. Pop: 6.7M. Cumulative incidence: 4842/10⁵

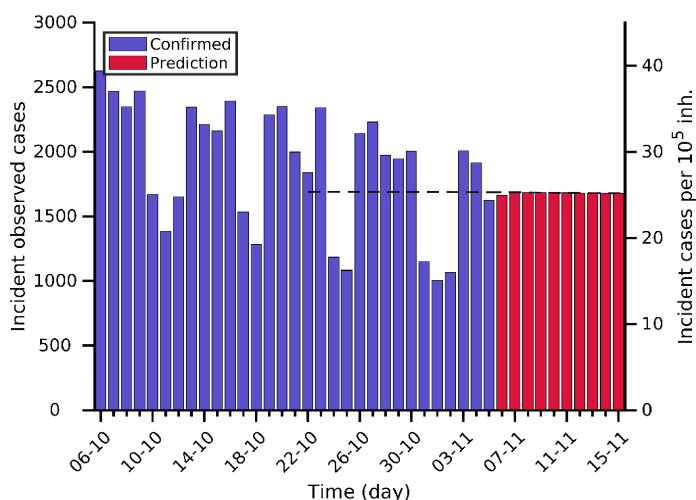


Predictions for next days

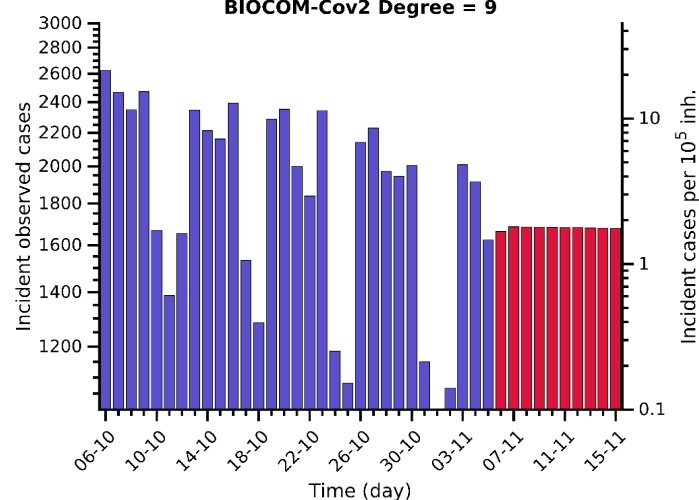
Day	Number of cases	95% Confidence Interval
08-11-2020	327664 (+5033)	[324619 - 330709]
12-11-2020	334393 (+11762)	[327457 - 341330]
15-11-2020	339429 (+16798)	[326215 - 352644]

Current indicators

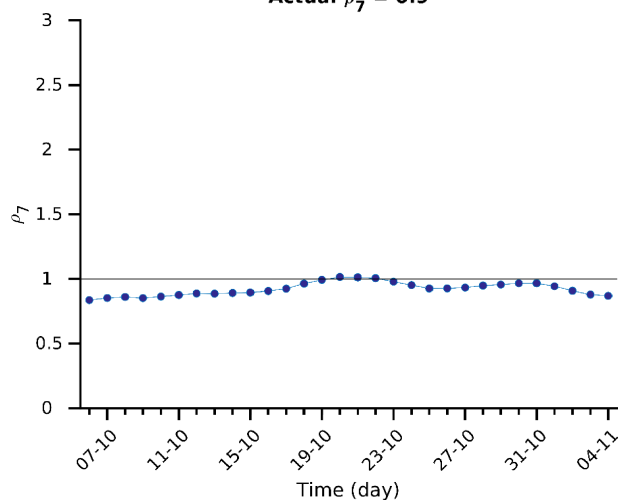
	A14	EPG	CFR	N7	D7
Today	355	309	1.26 %	1539	23
A Week ago	399	378	1.10 %	1843	31
Maximum	844	878	4.95 %	4182	283



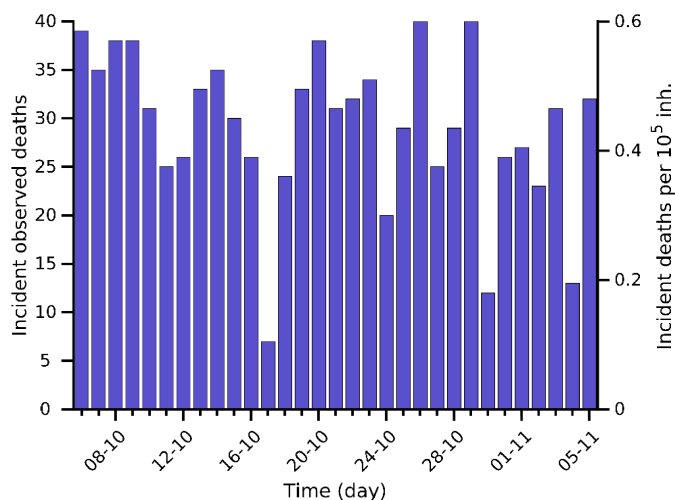
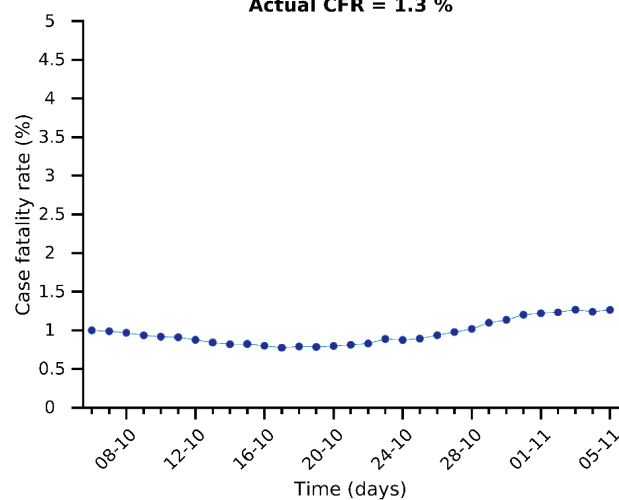
BIOCOM-Cov2 Degree = 9



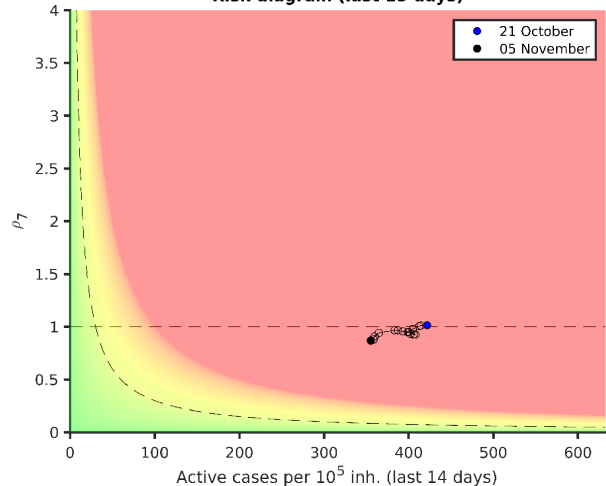
Actual $\rho_7 = 0.9$



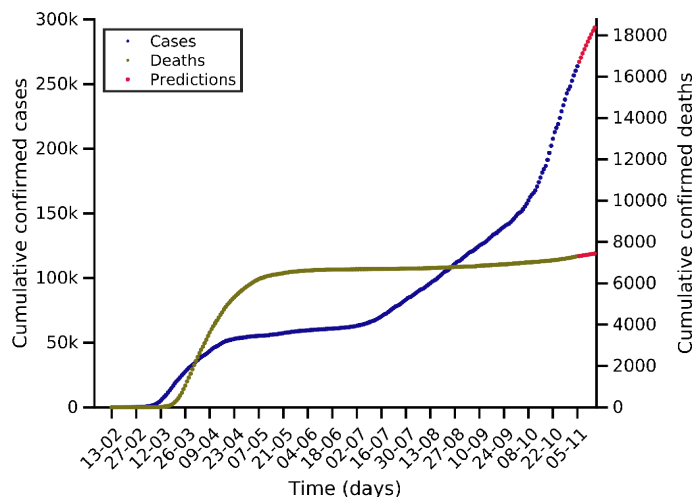
Actual CFR = 1.3 %



Risk diagram (last 15 days)



Catalunya 05-11-2020. Pop: 7.7M. Cumulative incidence: 3437/10⁵

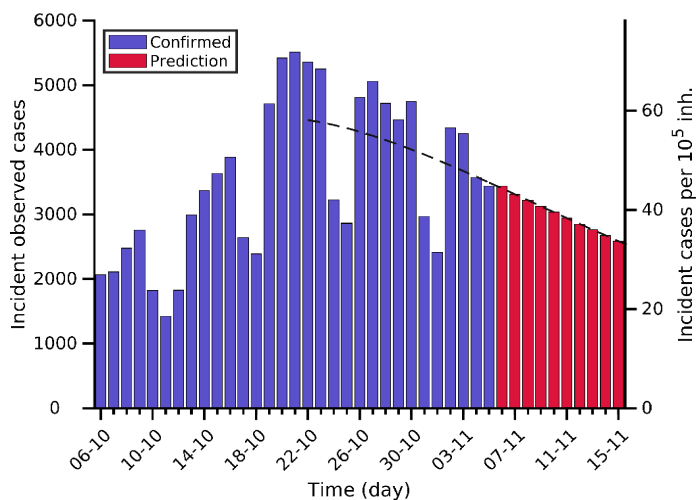


Predictions for next days

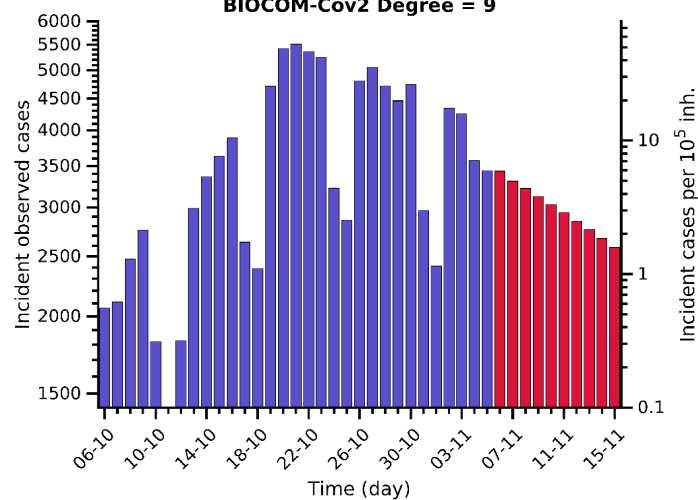
Day	Number of cases	95% Confidence Interval
08-11-2020	273783 (+9966)	[270692 - 276874]
12-11-2020	285739 (+21922)	[280351 - 291127]
15-11-2020	293762 (+29945)	[285039 - 302485]

Current indicators

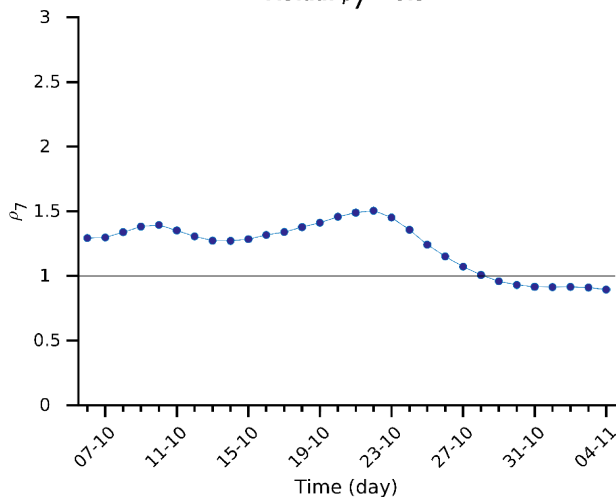
	A14	EPG	CFR	N7	D7
Today	731	654	0.65 %	3676	18
A Week ago	786	791	0.66 %	4341	10
Maximum	802	984	4.49 %	4634	197



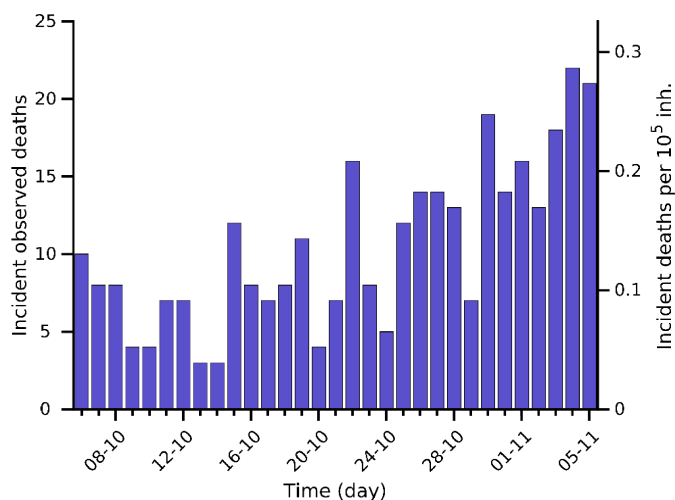
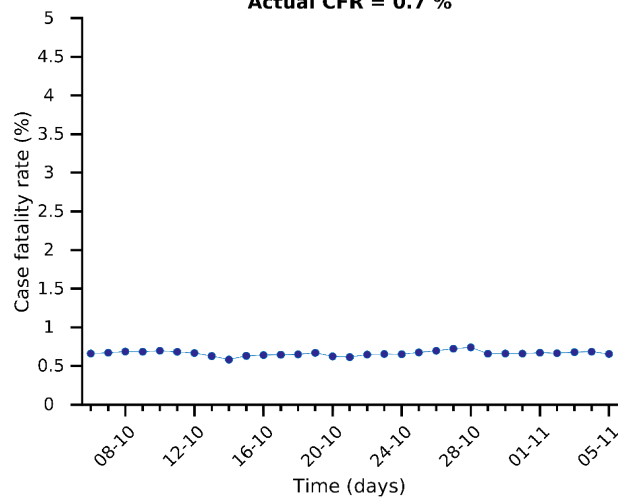
BIOCOM-Cov2 Degree = 9



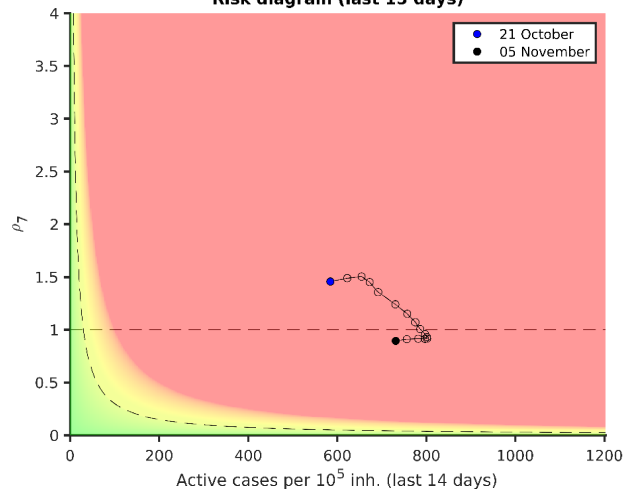
Actual $\rho_7 = 0.9$



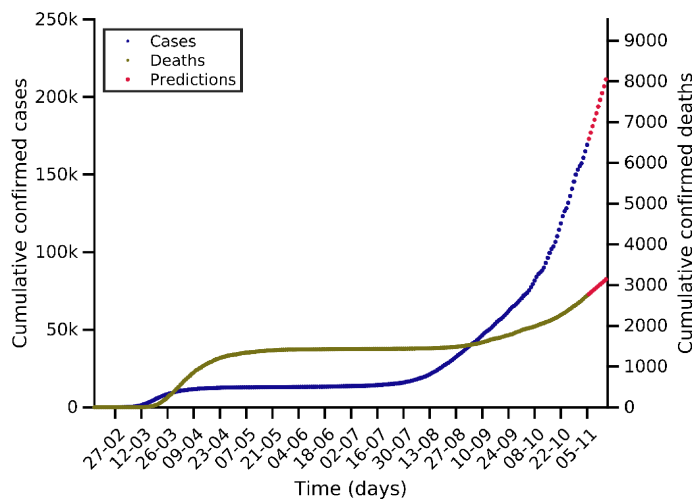
Actual CFR = 0.7 %



Risk diagram (last 15 days)



Andalucia 05-11-2020. Pop: 8.4M. Cumulative incidence: 2010/10⁵

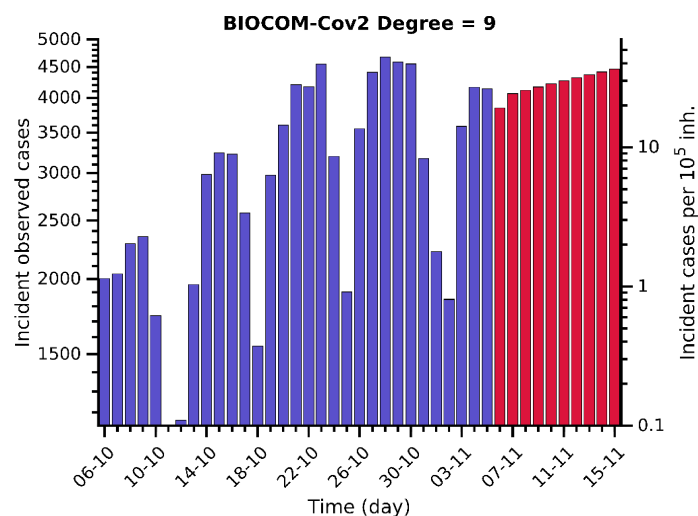
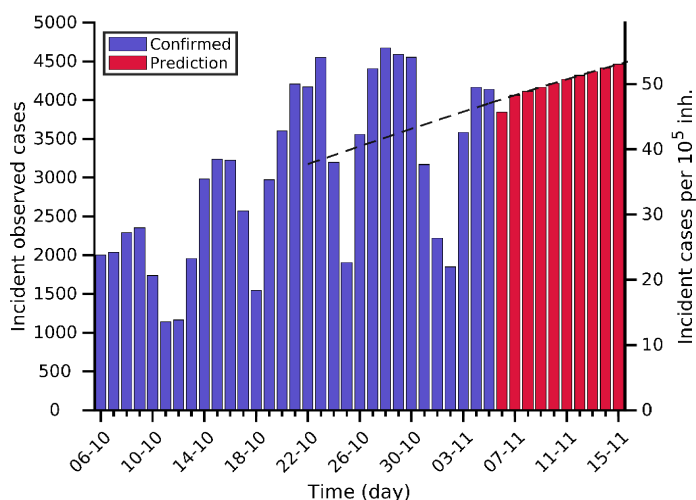


Predictions for next days

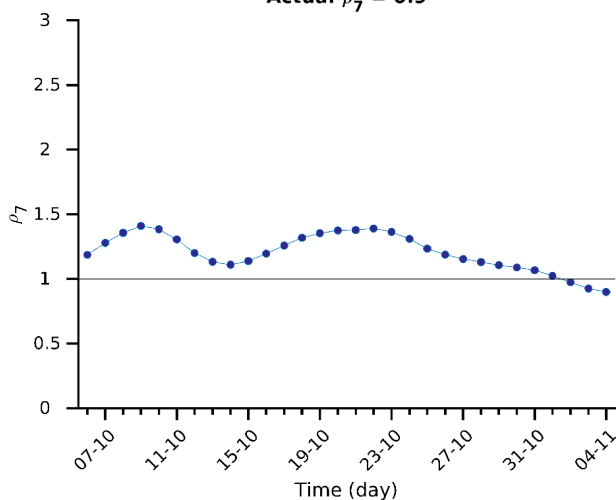
Day	Number of cases	95% Confidence Interval
08-11-2020	181188 (+12023)	[173053 - 189322]
12-11-2020	198158 (+28993)	[178817 - 217499]
15-11-2020	211402 (+42237)	[173547 - 249256]

Current indicators

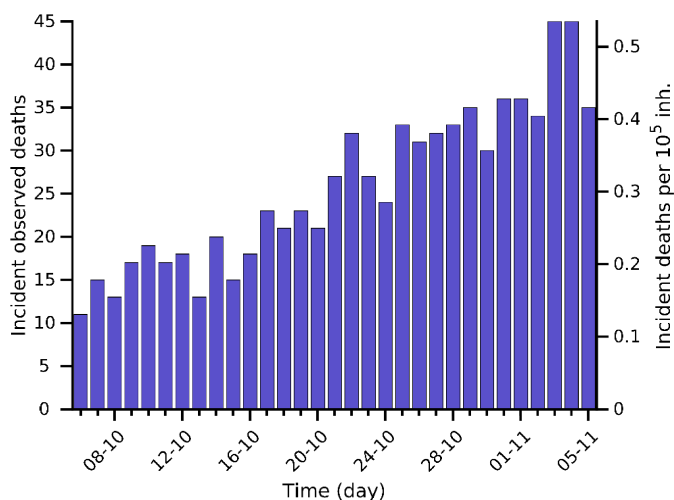
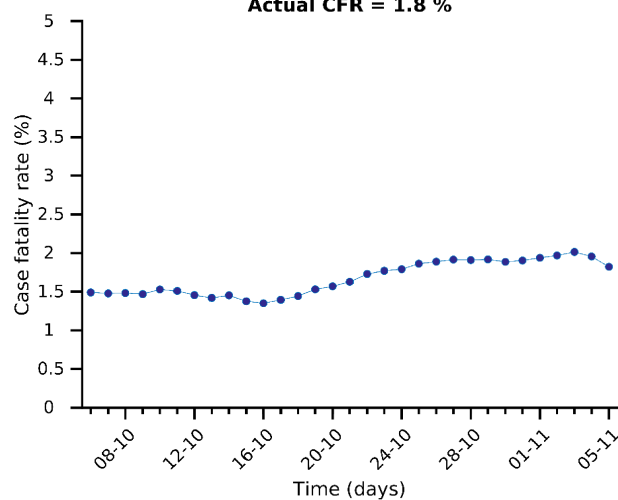
	A14	EPG	CFR	N7	D7
Today	601	540	1.82 %	3383	37
A Week ago	584	660	1.92 %	3839	31
Maximum	615	664	4.92 %	3880	47



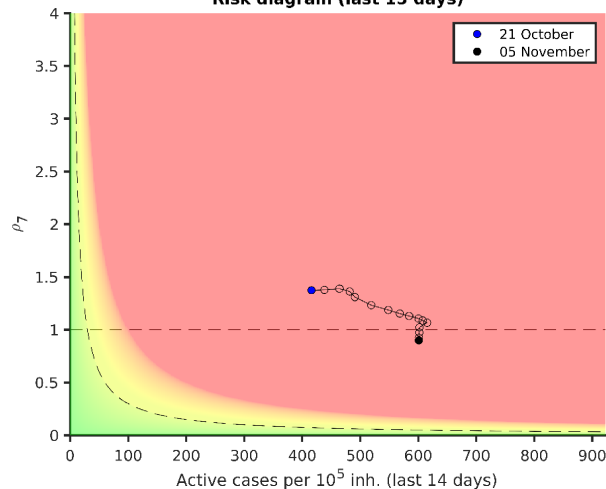
Actual $\rho_7 = 0.9$



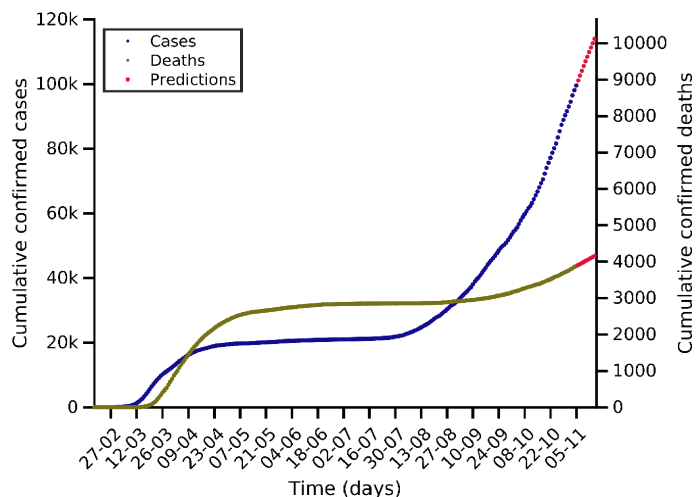
Actual CFR = 1.8 %



Risk diagram (last 15 days)



Castilla Leon 05-11-2020. Pop: 2.4M. Cumulative incidence: 4150/10⁵

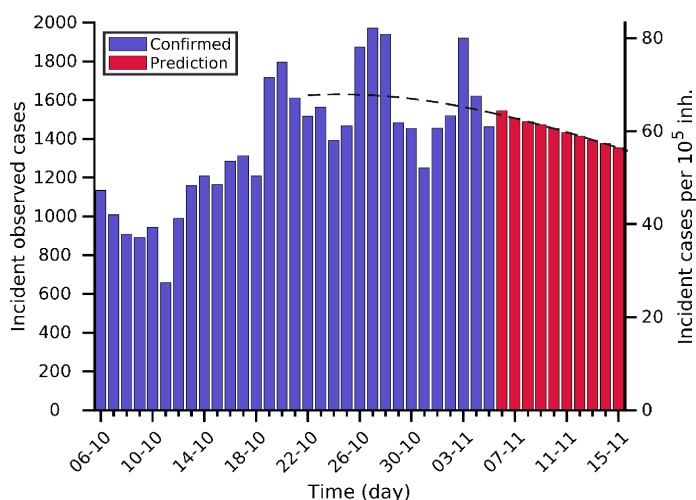


Predictions for next days

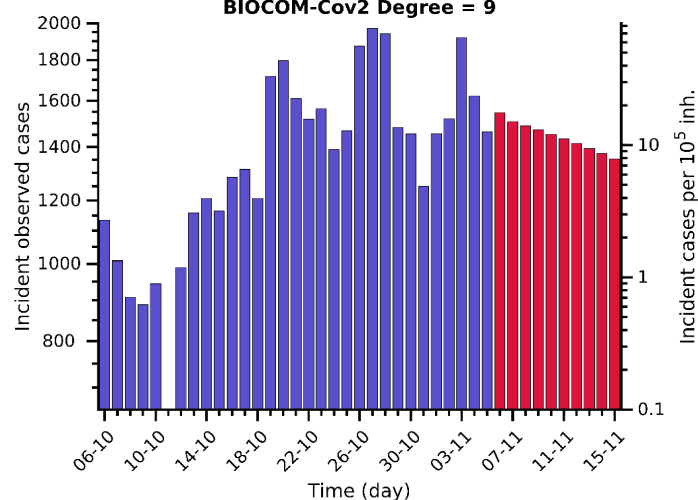
Day	Number of cases	95% Confidence Interval
08-11-2020	104123 (+4541)	[102953 - 105294]
12-11-2020	109897 (+10315)	[107600 - 112194]
15-11-2020	114019 (+14437)	[110000 - 118039]

Current indicators

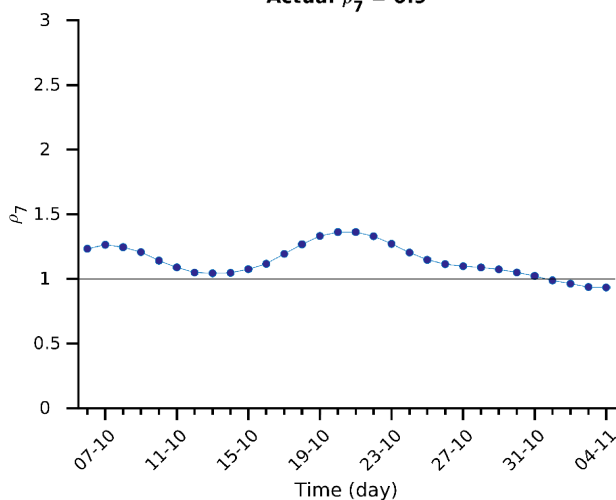
	A14	EPG	CFR	N7	D7
Today	933	871	2.77 %	1526	28
A Week ago	923	1005	2.73 %	1670	25
Maximum	937	1005	4.60 %	1675	80



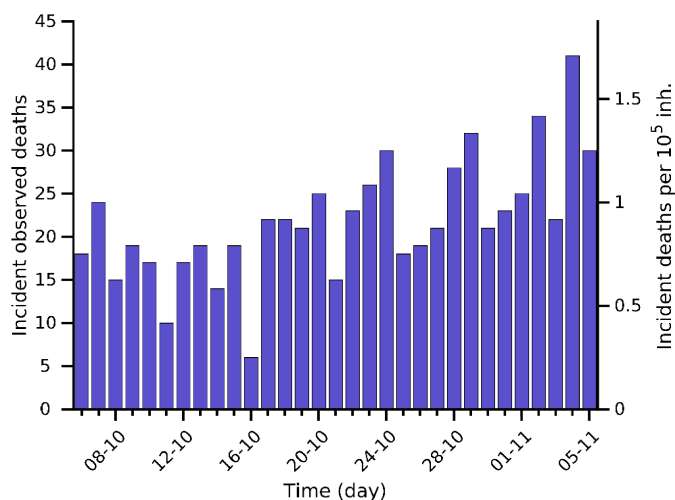
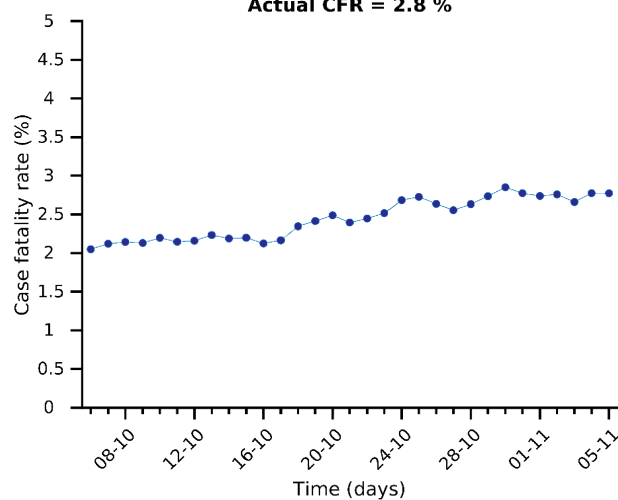
BIOCOM-Cov2 Degree = 9



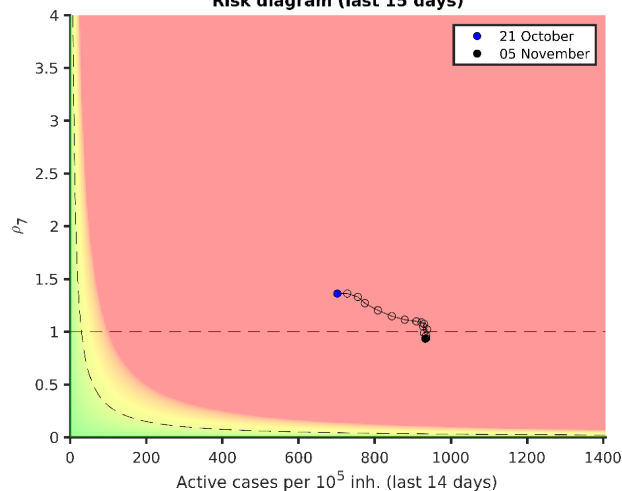
Actual $\rho_7 = 0.9$



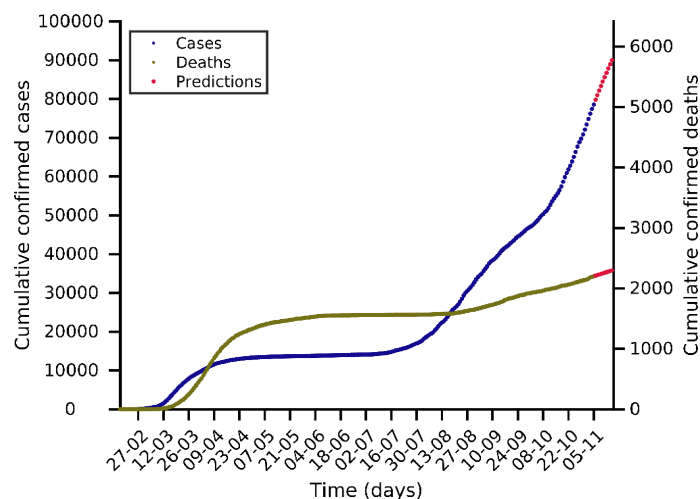
Actual CFR = 2.8 %



Risk diagram (last 15 days)



Euskadi 05-11-2020. Pop: 2.2M. Cumulative incidence: 3560/10⁵

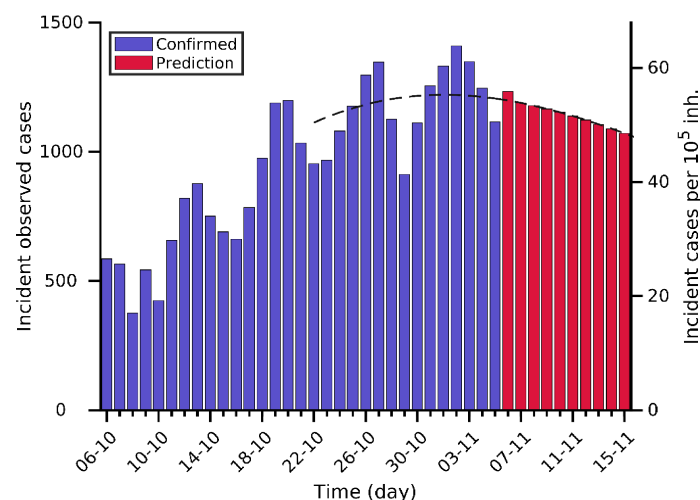


Predictions for next days

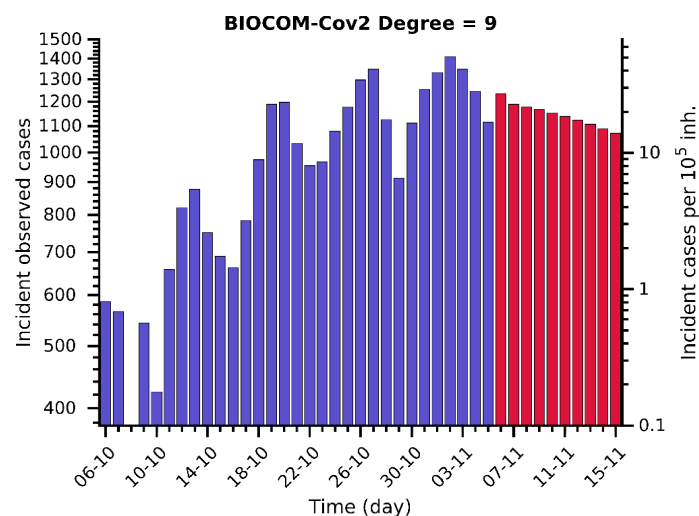
Day	Number of cases	95% Confidence Interval
08-11-2020	82188 (+3601)	[81069 - 83307]
12-11-2020	86769 (+8182)	[84576 - 88962]
15-11-2020	90036 (+11449)	[86224 - 93848]

Current indicators

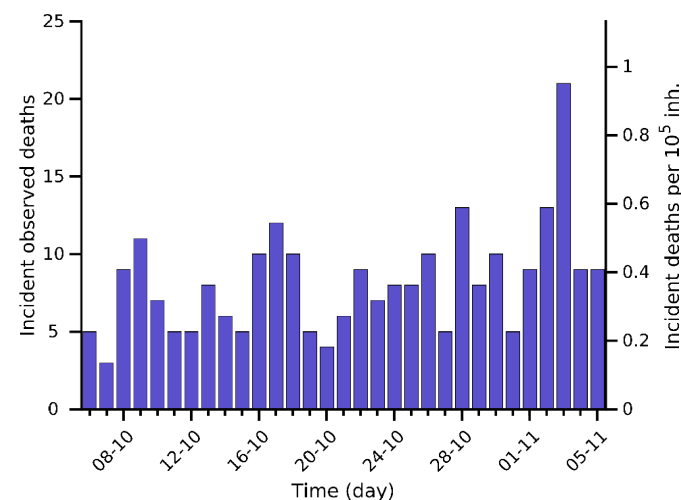
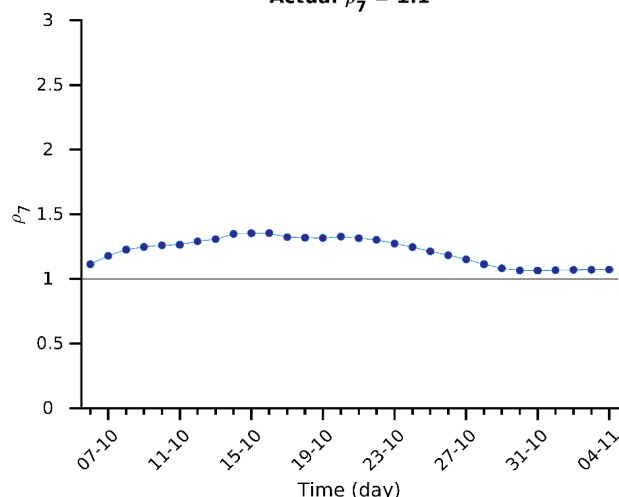
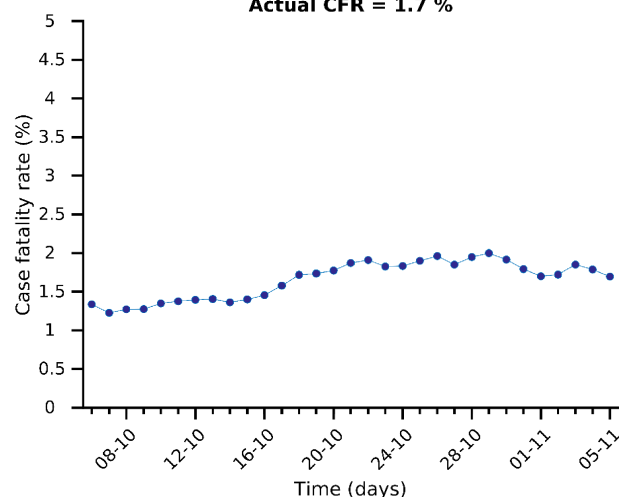
	A14	EPG	CFR	N7	D7
Today	758	812	1.70 %	1260	11
A Week ago	666	742	2.00 %	1130	8
Maximum	758	812	4.76 %	1260	48



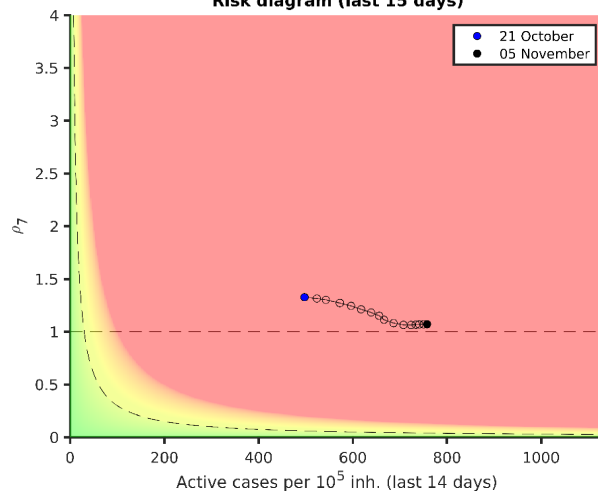
Actual $\rho_7 = 1.1$



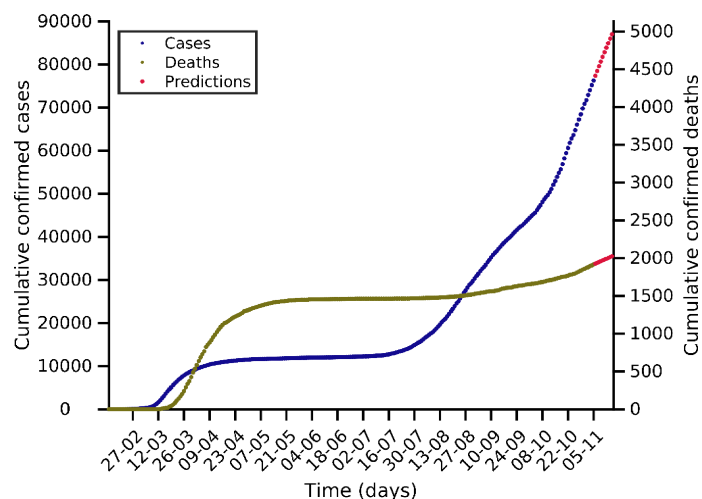
Actual CFR = 1.7 %



Risk diagram (last 15 days)



C Valenciana 05-11-2020. Pop: 5.0M. Cumulative incidence: 1525/10⁵

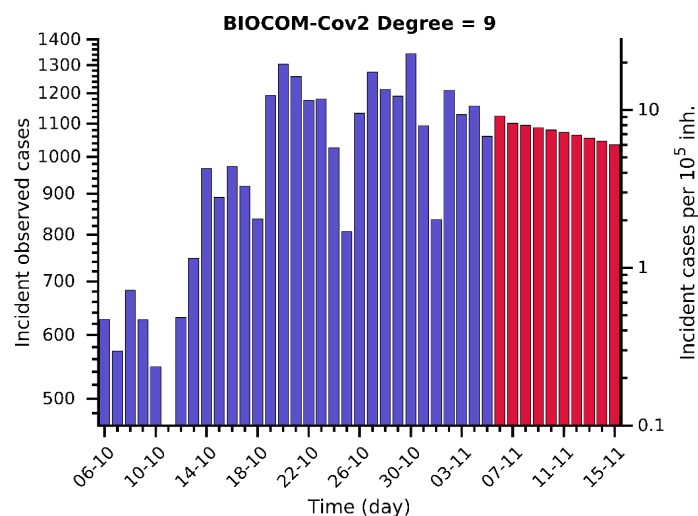
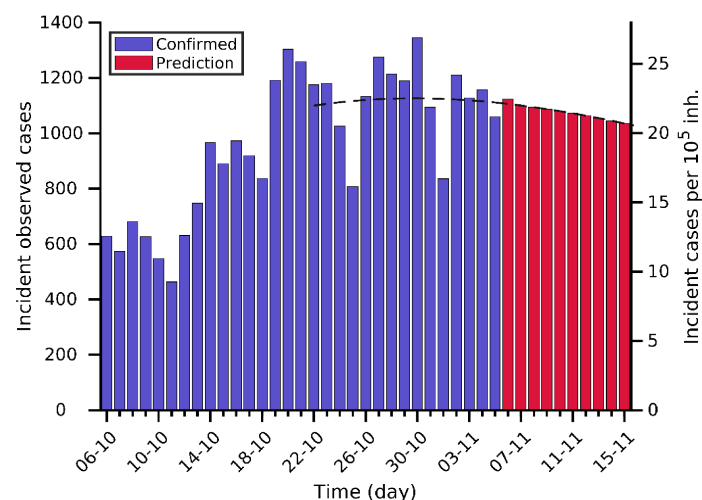


Predictions for next days

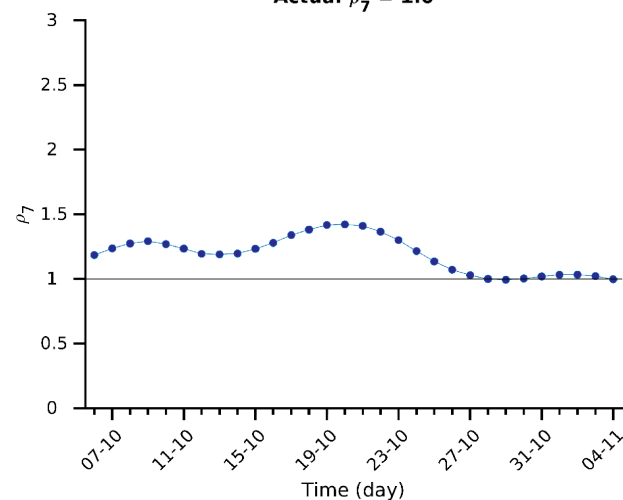
Day	Number of cases	95% Confidence Interval
08-11-2020	79611 (+3319)	[78907 - 80315]
12-11-2020	83915 (+7623)	[82475 - 85355]
15-11-2020	87051 (+10759)	[84465 - 89637]

Current indicators

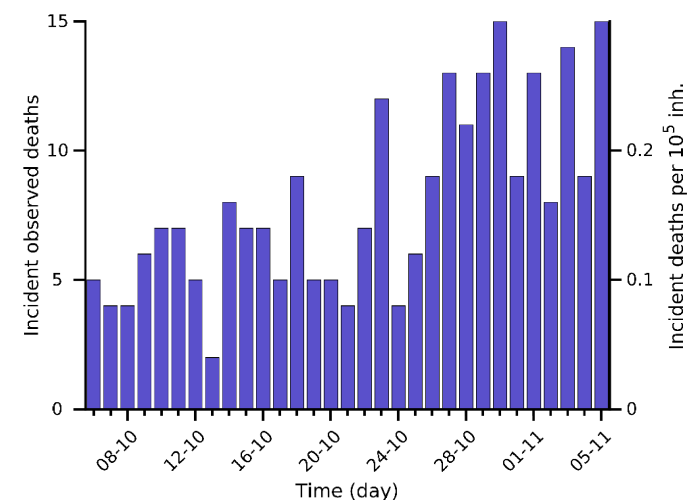
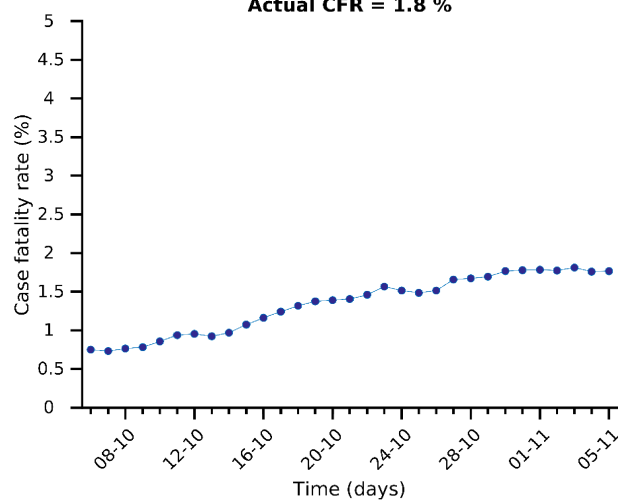
	A14	EPG	CFR	N7	D7
Today	313	312	1.77 %	1119	12
A Week ago	309	309	1.69 %	1118	10
Maximum	321	357	4.82 %	1166	51



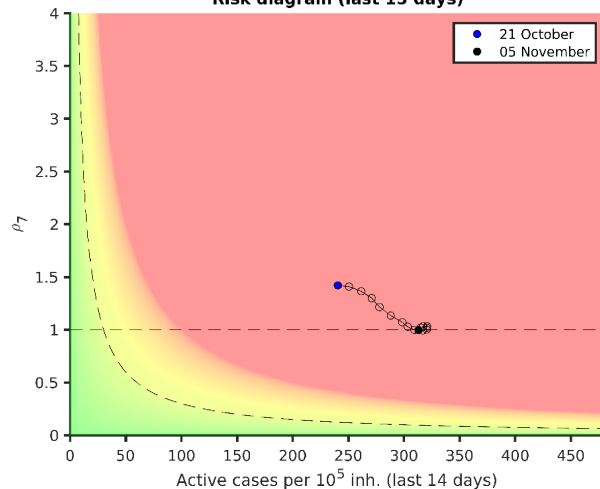
Actual $\rho_7 = 1.0$



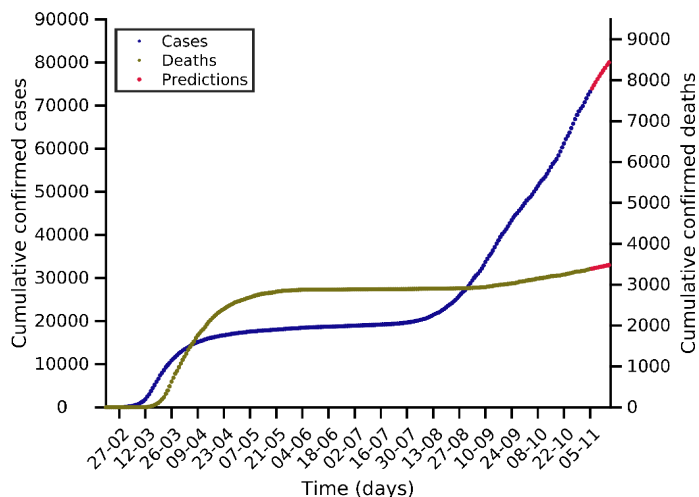
Actual CFR = 1.8 %



Risk diagram (last 15 days)



Castilla-La Mancha 05-11-2020. Pop: 2.0M. Cumulative incidence: 3603/10⁵

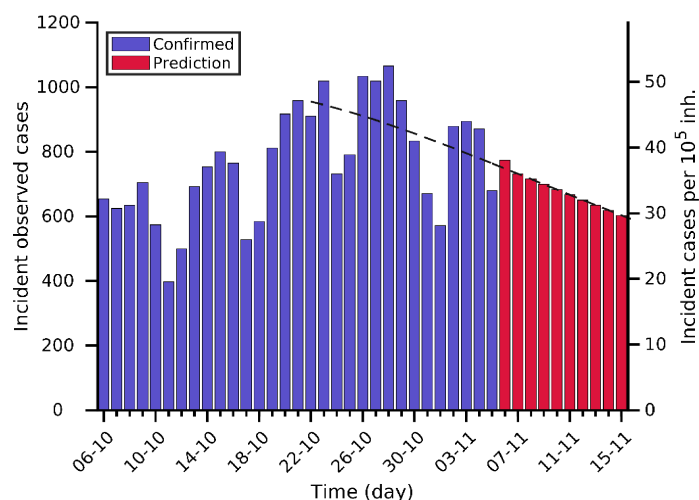


Predictions for next days

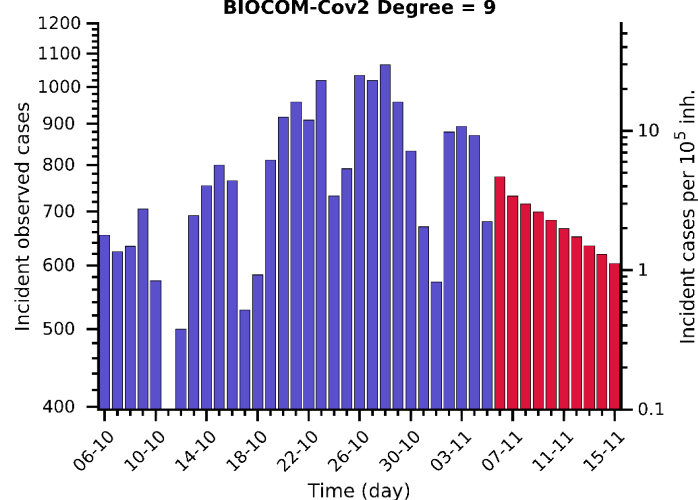
Day	Number of cases	95% Confidence Interval
08-11-2020	75461 (+2221)	[74552 - 76370]
12-11-2020	78161 (+4921)	[76501 - 79822]
15-11-2020	80019 (+6779)	[77237 - 82800]

Current indicators

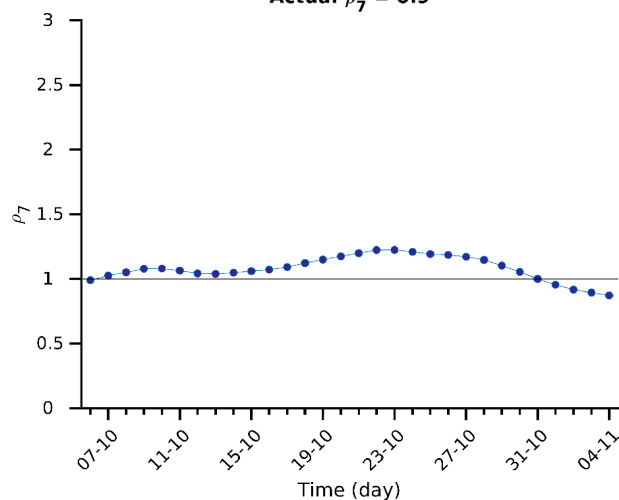
	A14	EPG	CFR	N7	D7
Today	591	516	1.63 %	771	9
A Week ago	595	682	1.46 %	946	10
Maximum	608	1077	4.91 %	946	94



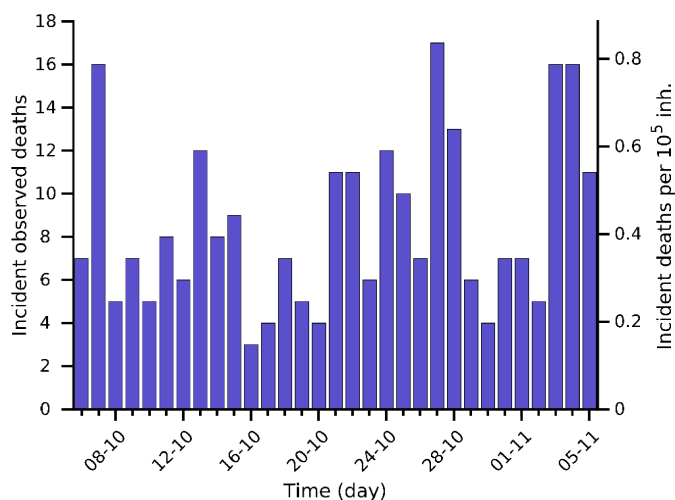
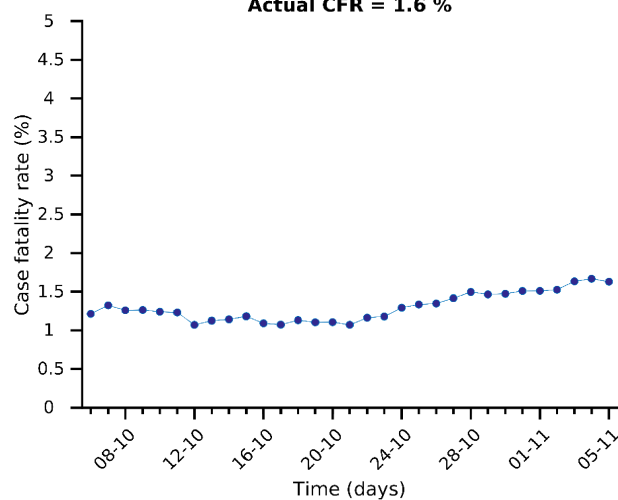
BIOCOM-Cov2 Degree = 9



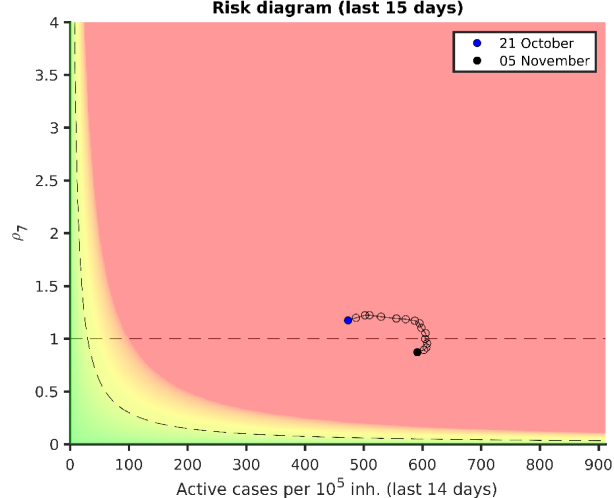
Actual $\rho_7 = 0.9$



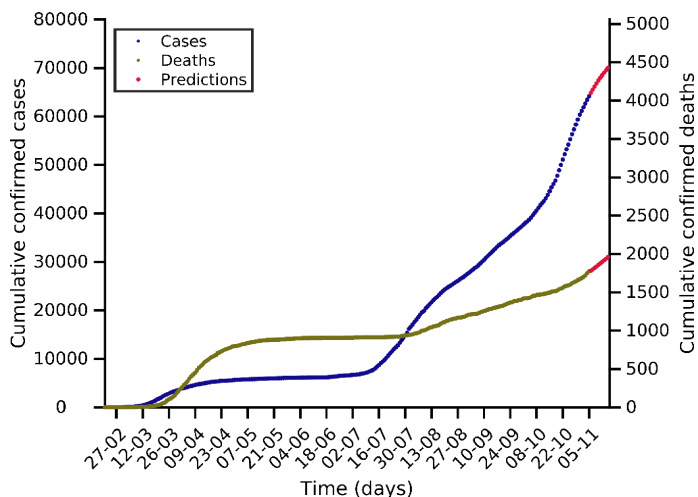
Actual CFR = 1.6 %



Risk diagram (last 15 days)



Aragon 05-11-2020. Pop: 1.3M. Cumulative incidence: 4862/10⁵

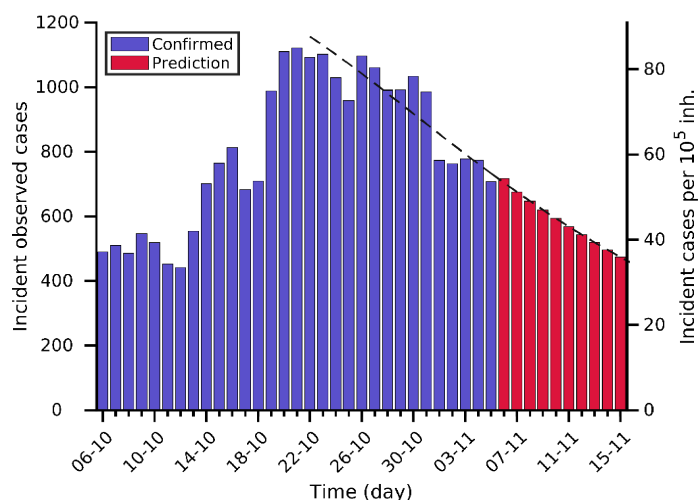


Predictions for next days

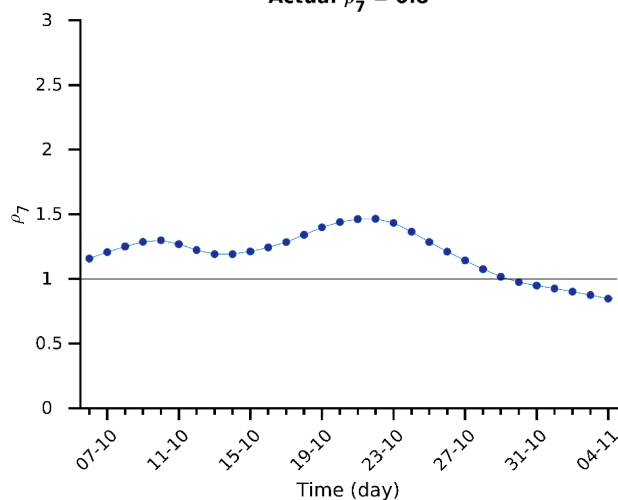
Day	Number of cases	95% Confidence Interval
08-11-2020	66185 (+2040)	[65776 - 66593]
12-11-2020	68511 (+4366)	[67853 - 69168]
15-11-2020	70000 (+5855)	[68994 - 71006]

Current indicators

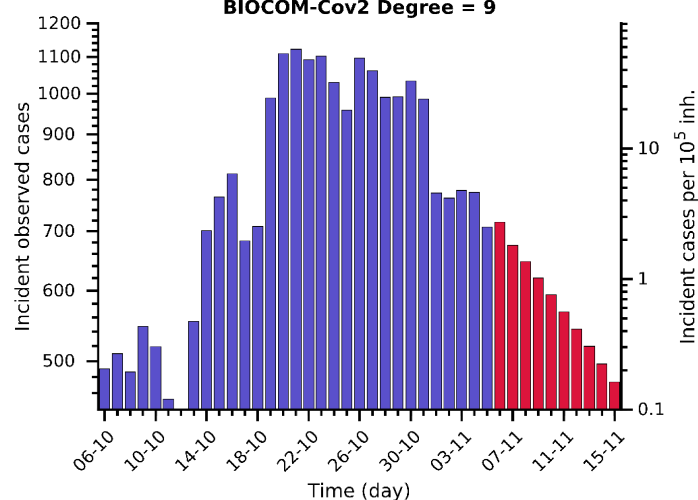
	A14	EPG	CFR	N7	D7
Today	989	838	3.11 %	831	19
A Week ago	1042	1121	2.79 %	1033	12
Maximum	1087	1256	4.71 %	1073	30



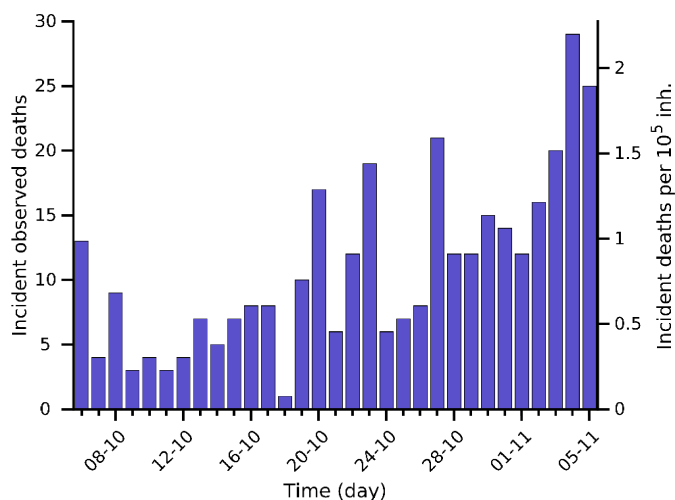
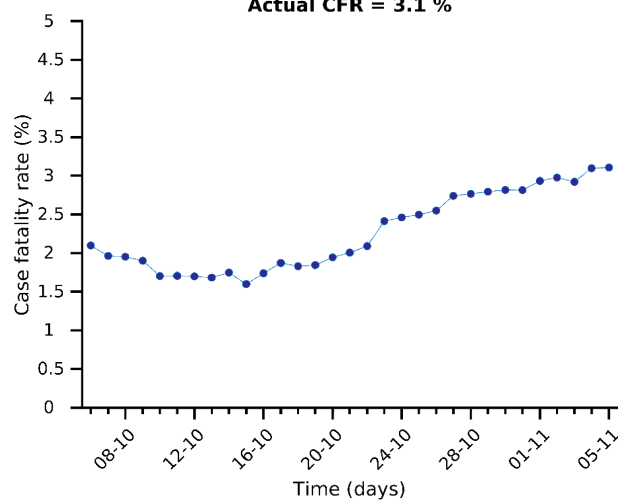
Actual $\rho_7 = 0.8$



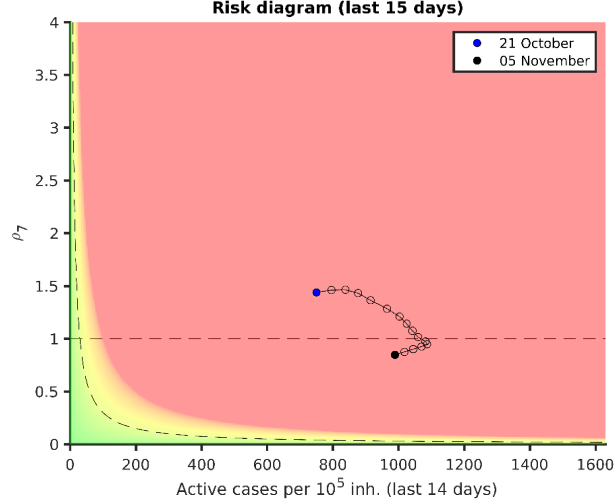
BIOCOM-Cov2 Degree = 9



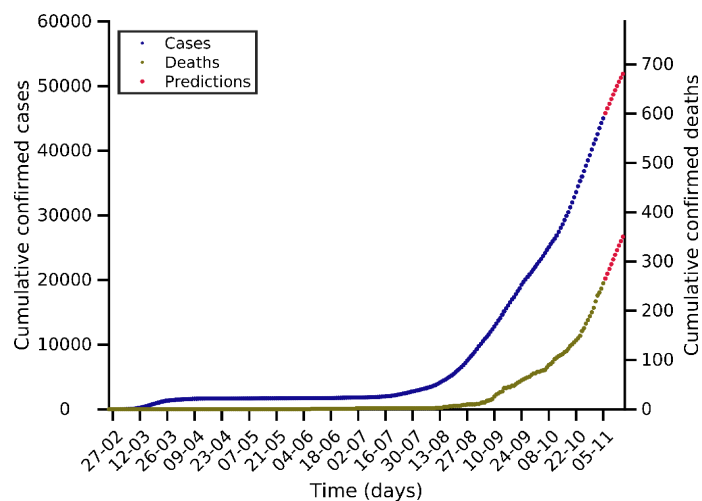
Actual CFR = 3.1 %



Risk diagram (last 15 days)



Murcia 05-11-2020. Pop: 1.5M. Cumulative incidence: 3014/10⁵

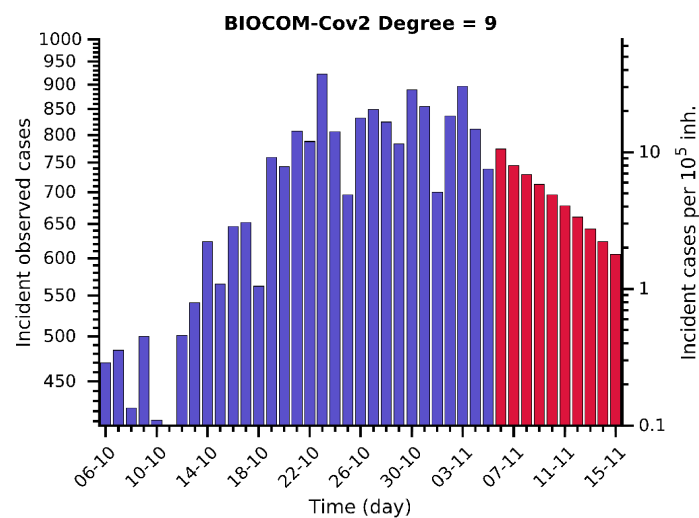
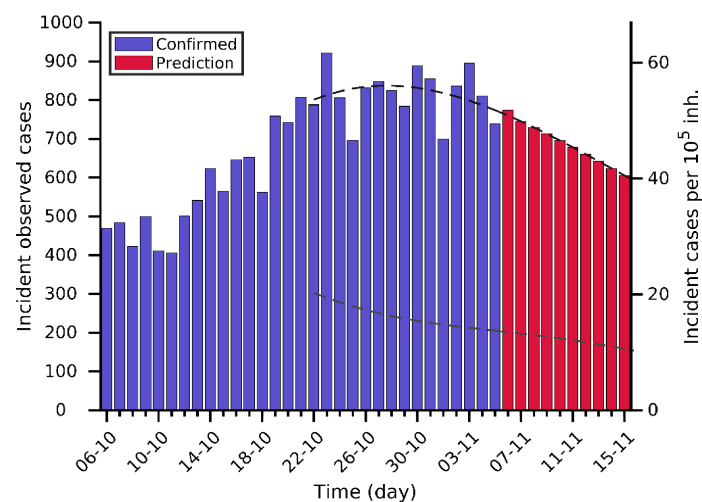


Predictions for next days

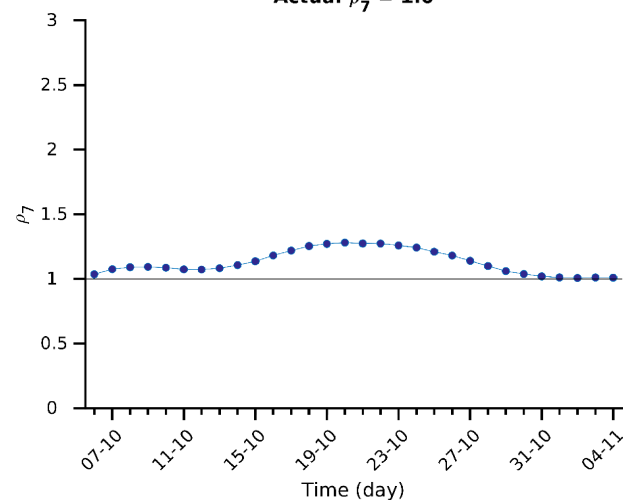
Day	Number of cases	95% Confidence Interval
08-11-2020	47280 (+2249)	[46921 - 47638]
12-11-2020	50027 (+4996)	[49383 - 50672]
15-11-2020	51899 (+6868)	[50839 - 52959]

Current indicators

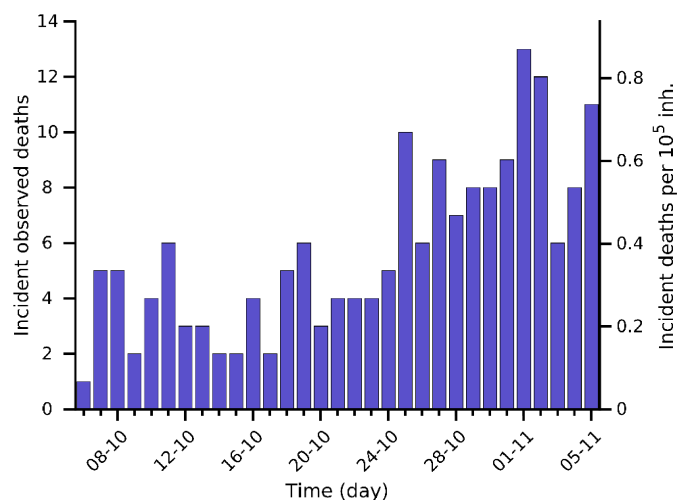
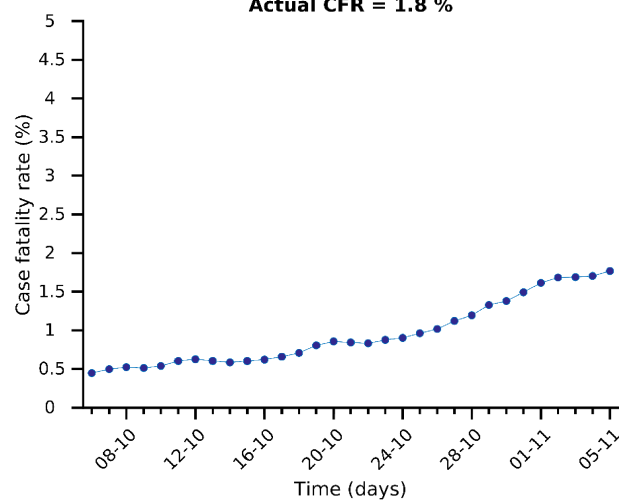
	A14	EPG	CFR	N7	D7
Today	766	773	1.77 %	818	10
A Week ago	714	786	1.33 %	816	7
Maximum	769	810	4.76 %	826	10



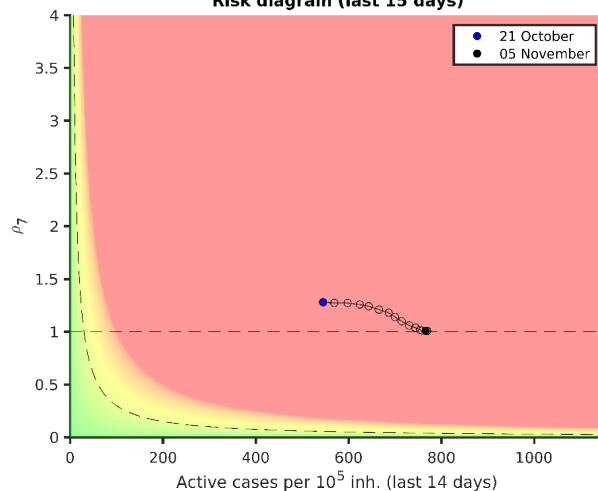
Actual $\rho_7 = 1.0$



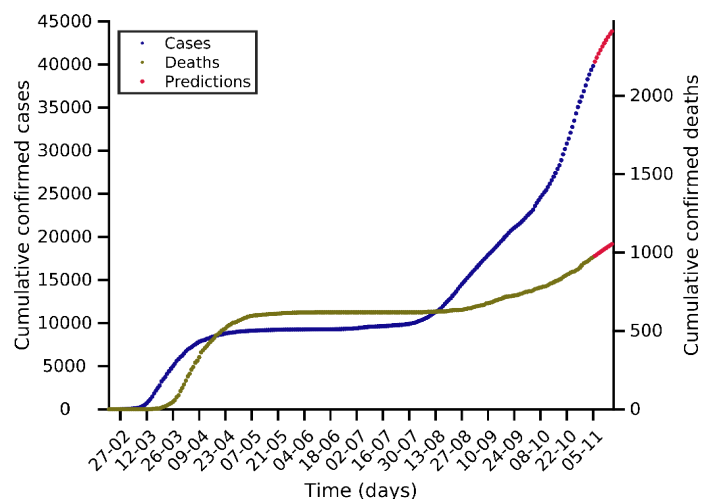
Actual CFR = 1.8 %



Risk diagram (last 15 days)



Galicia 05-11-2020. Pop: 2.7M. Cumulative incidence: 1475/10⁵

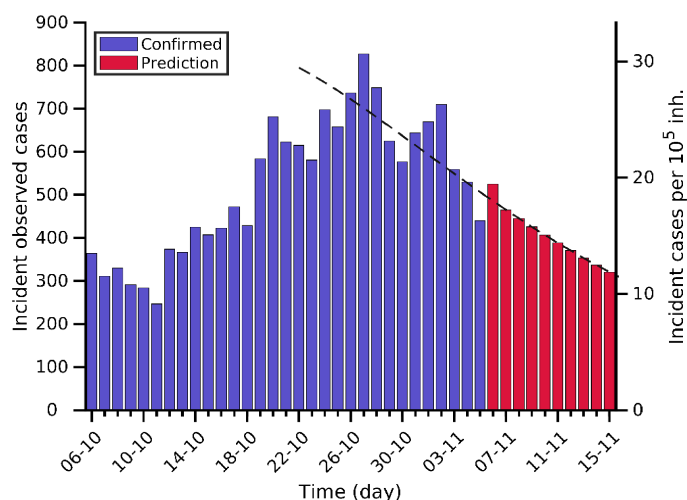


Predictions for next days

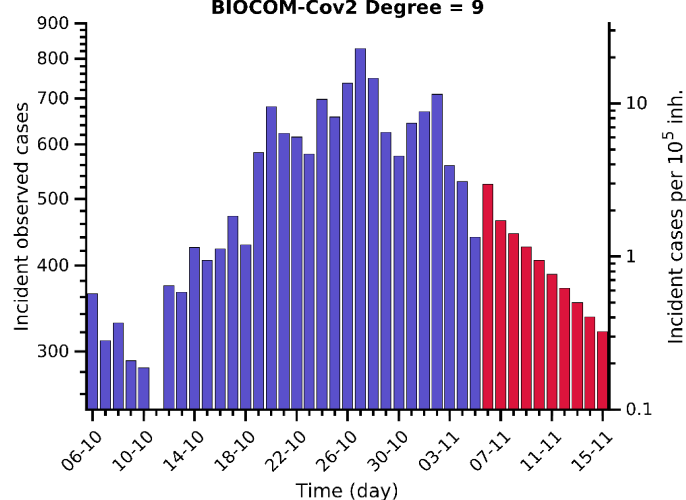
Day	Number of cases	95% Confidence Interval
08-11-2020	41261 (+1435)	[40374 - 42148]
12-11-2020	42853 (+3027)	[41444 - 44262]
15-11-2020	43864 (+4038)	[41730 - 45997]

Current indicators

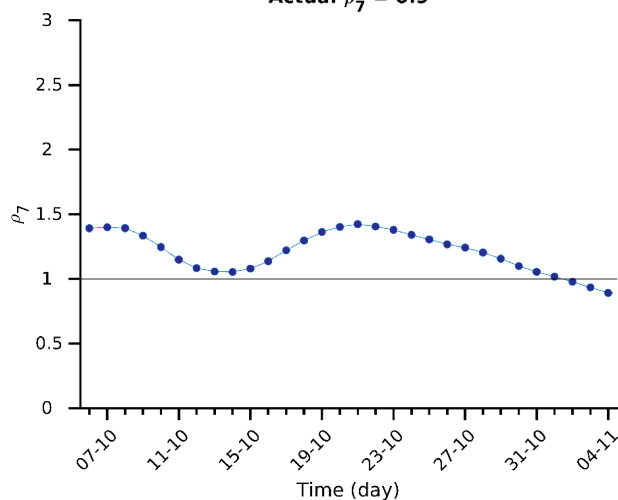
	A14	EPG	CFR	N7	D7
Today	334	297	2.51 %	590	10
A Week ago	322	388	2.66 %	696	7
Maximum	348	390	4.77 %	696	24



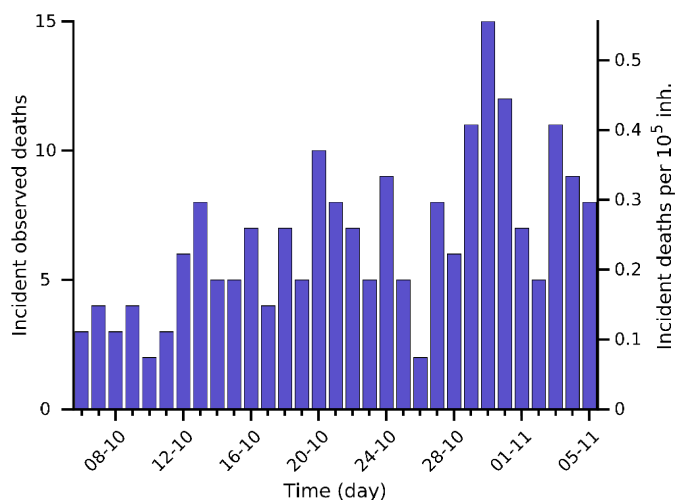
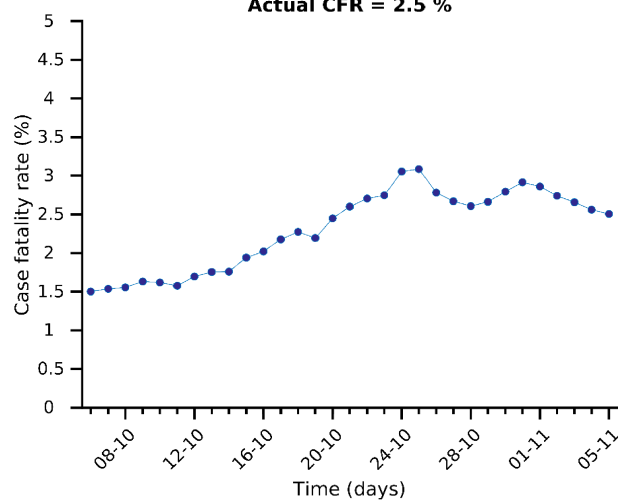
BIOCOM-Cov2 Degree = 9



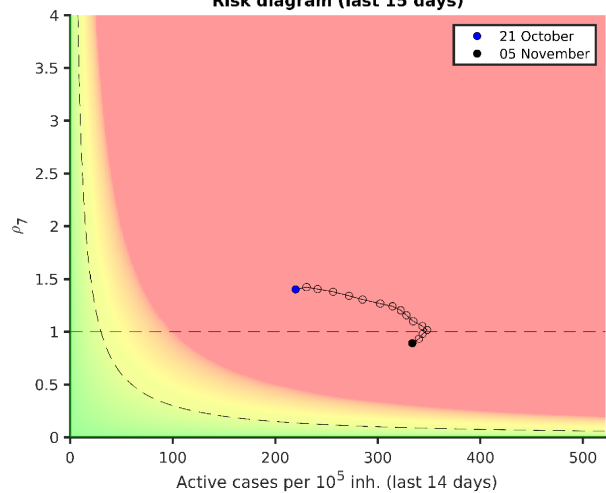
Actual $\rho_7 = 0.9$



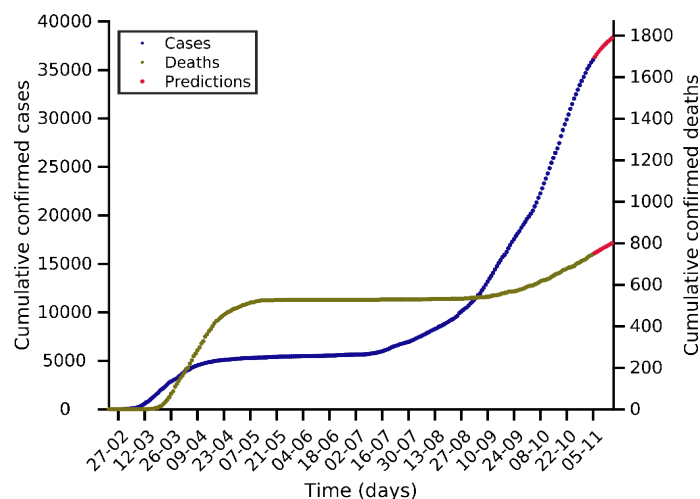
Actual CFR = 2.5 %



Risk diagram (last 15 days)



Navarra 05-11-2020. Pop: 0.7M. Cumulative incidence: 5508/10⁵

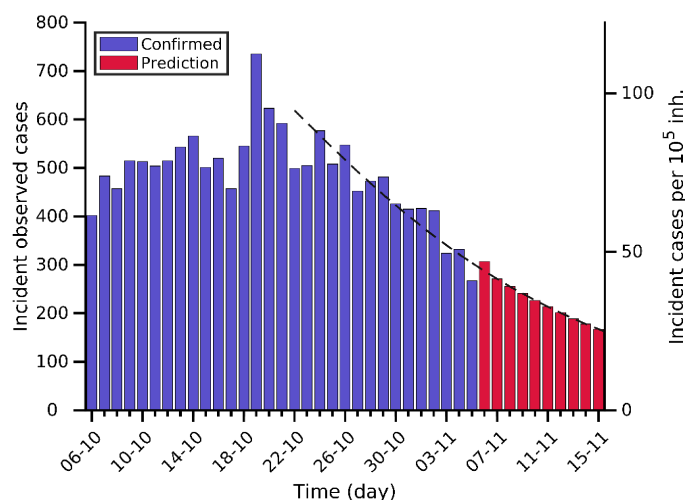


Predictions for next days

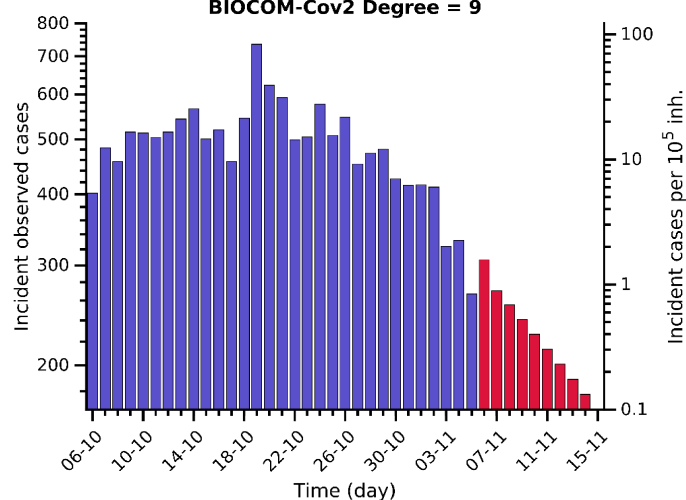
Day	Number of cases	95% Confidence Interval
08-11-2020	36868 (+833)	[36489 - 37247]
12-11-2020	37750 (+1715)	[37189 - 38311]
15-11-2020	38284 (+2249)	[37480 - 39087]

Current indicators

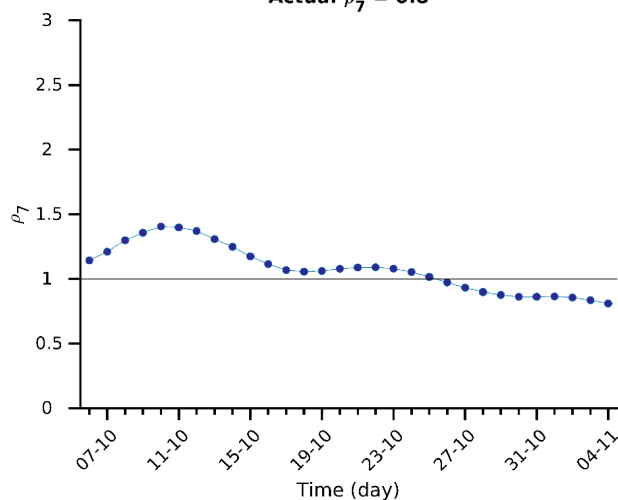
	A14	EPG	CFR	N7	D7
Today	938	759	1.13 %	370	6
A Week ago	1149	1032	1.35 %	506	4
Maximum	1180	1270	3.99 %	582	17



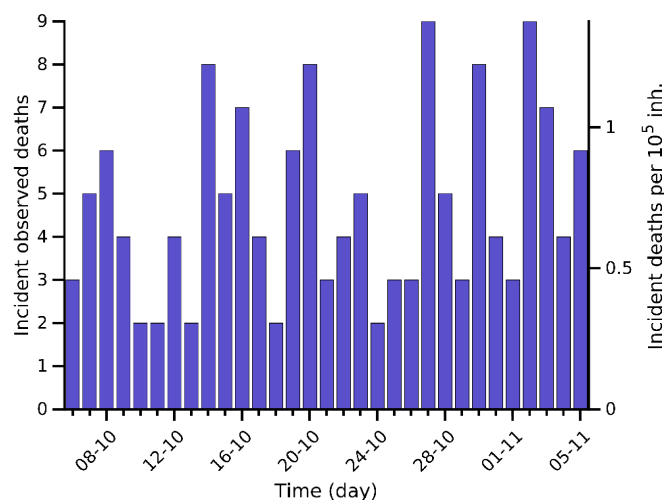
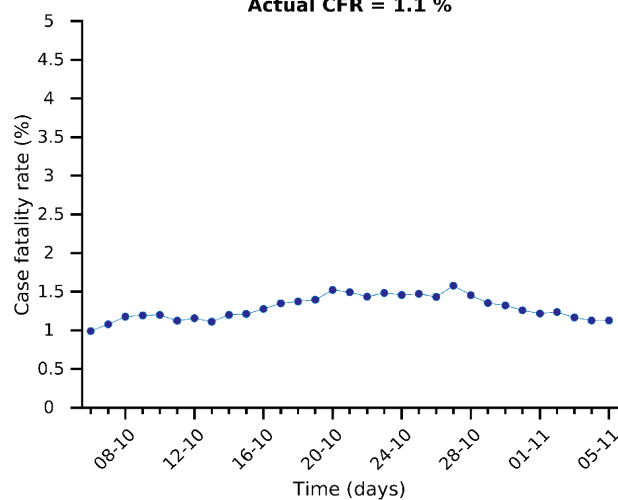
BIOCOM-Cov2 Degree = 9



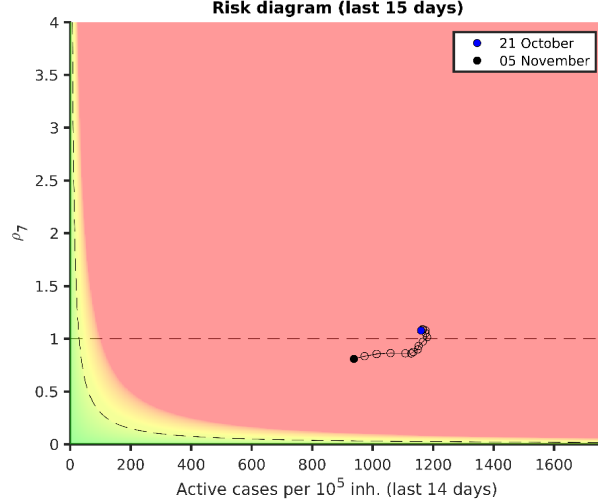
Actual $\rho_7 = 0.8$



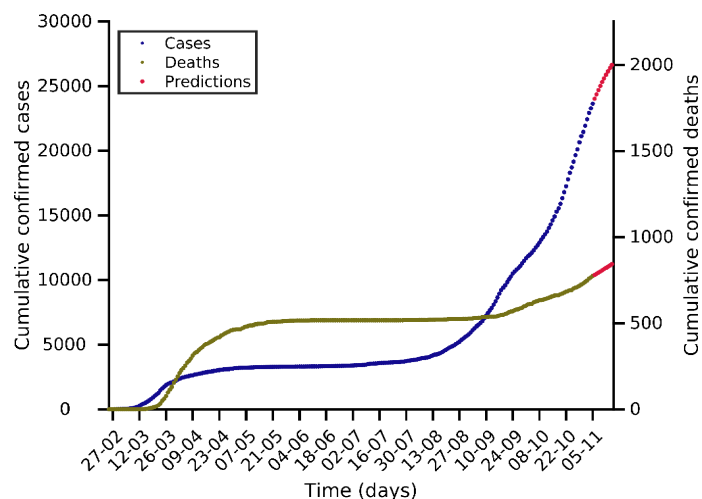
Actual CFR = 1.1 %



Risk diagram (last 15 days)



Extremadura 05-11-2020. Pop: 1.1M. Cumulative incidence: 2215/10⁵

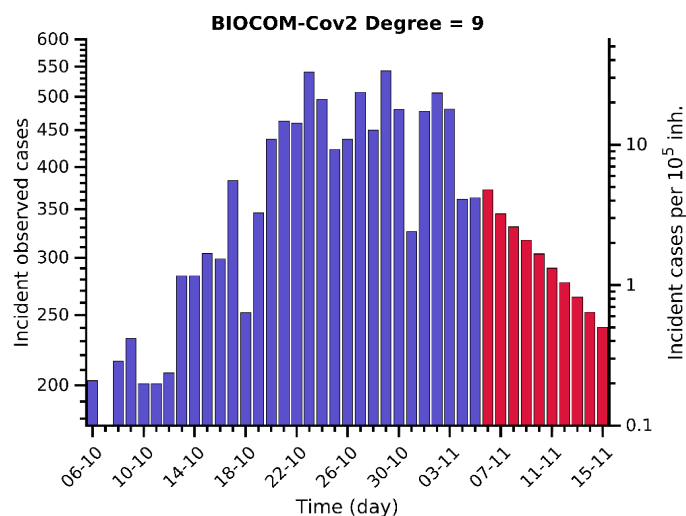
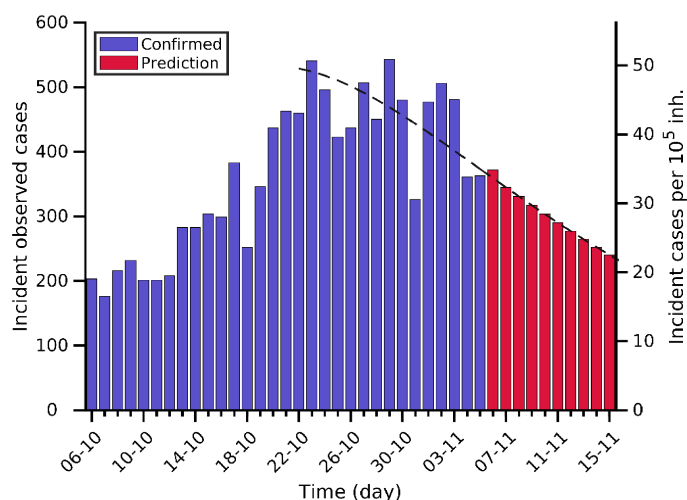


Predictions for next days

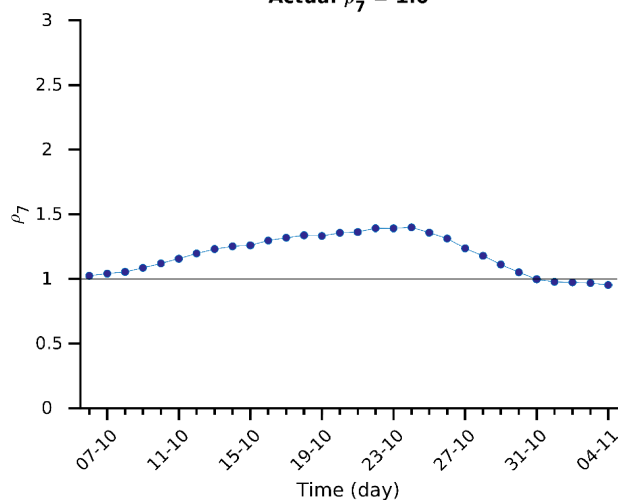
Day	Number of cases	95% Confidence Interval
08-11-2020	24693 (+1048)	[24218 - 25168]
12-11-2020	25881 (+2236)	[25120 - 26642]
15-11-2020	26638 (+2993)	[25483 - 27793]

Current indicators

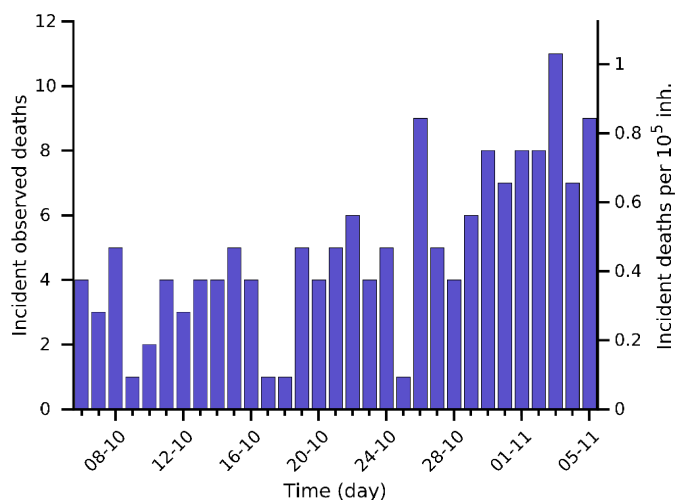
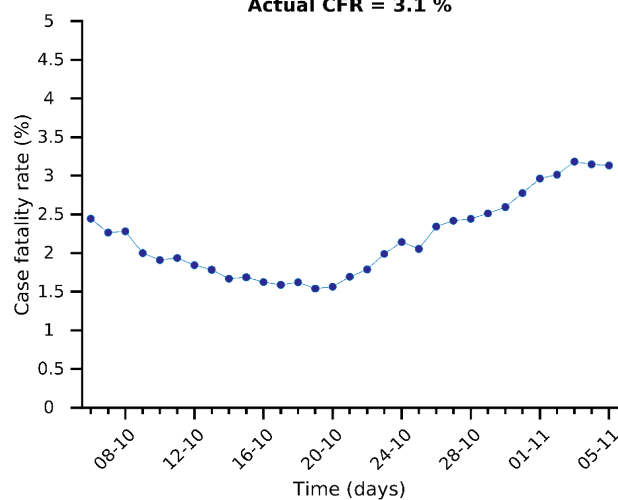
	A14	EPG	CFR	N7	D7
Today	599	570	3.13 %	428	8
A Week ago	565	666	2.51 %	485	5
Maximum	617	692	3.18 %	485	19



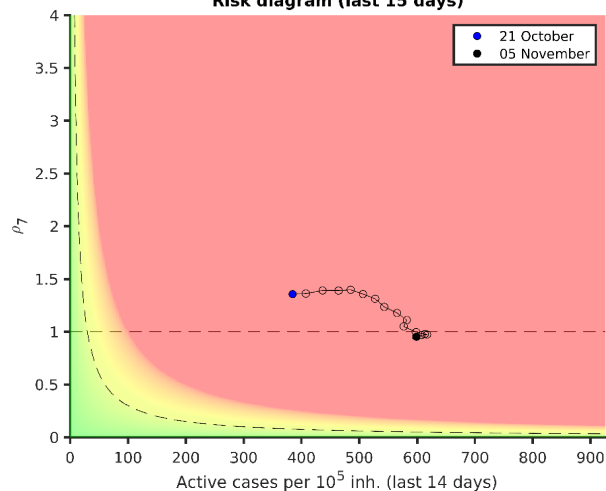
Actual $\rho_7 = 1.0$



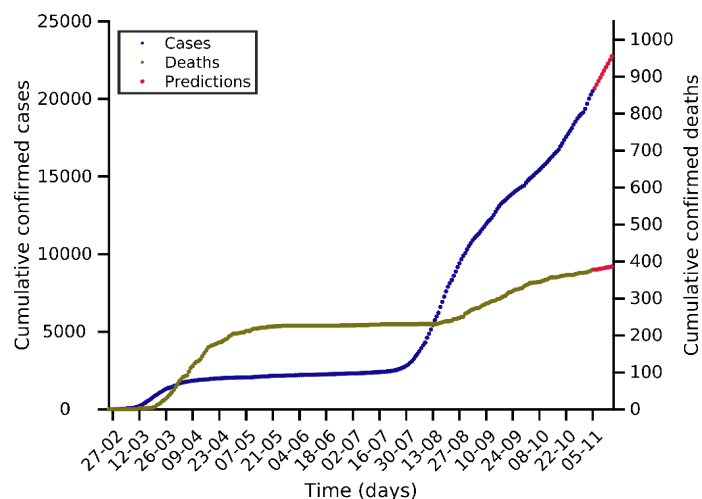
Actual CFR = 3.1 %



Risk diagram (last 15 days)



Baleares 05-11-2020. Pop: 1.1M. Cumulative incidence: 1785/10⁵

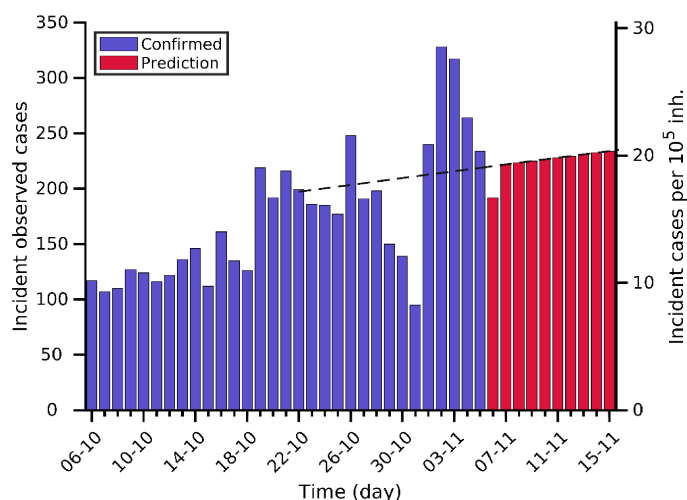


Predictions for next days

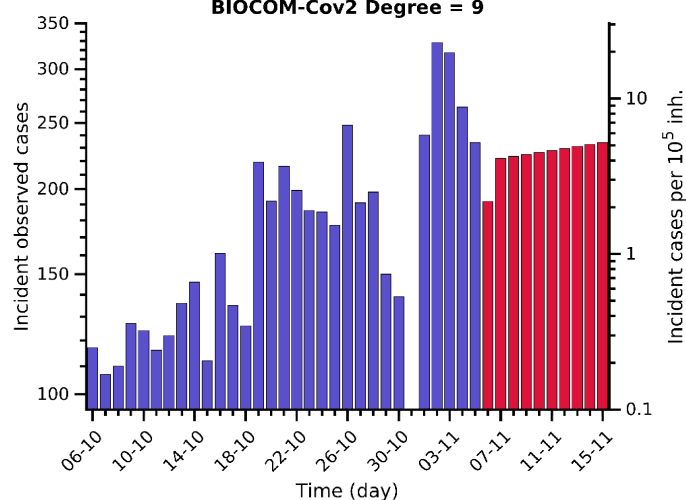
Day	Number of cases	95% Confidence Interval
08-11-2020	21154 (+637)	[20517 - 21823]
12-11-2020	22063 (+1546)	[20517 - 23630]
15-11-2020	22760 (+2243)	[20517 - 25810]

Current indicators

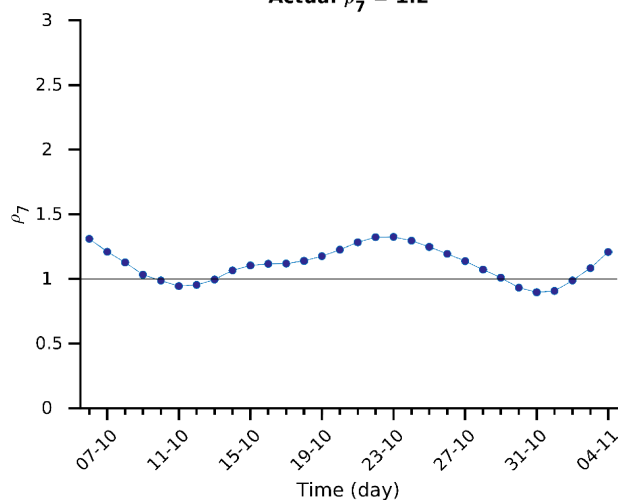
	A14	EPG	CFR	N7	D7
Today	257	310	0.87 %	231	1
A Week ago	225	241	0.80 %	191	1
Maximum	352	397	4.92 %	309	7



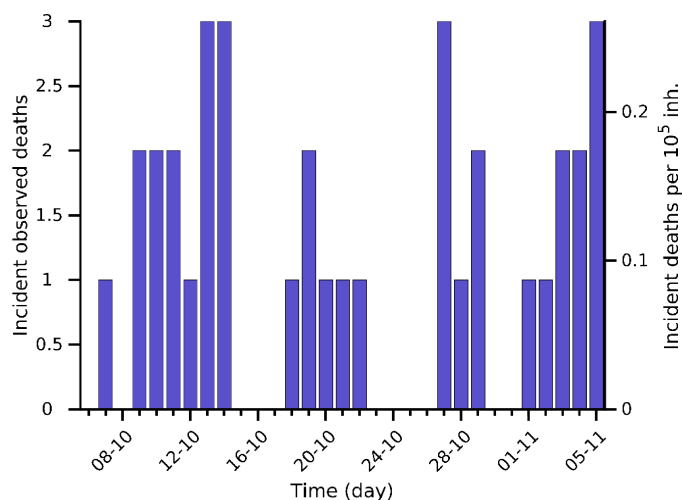
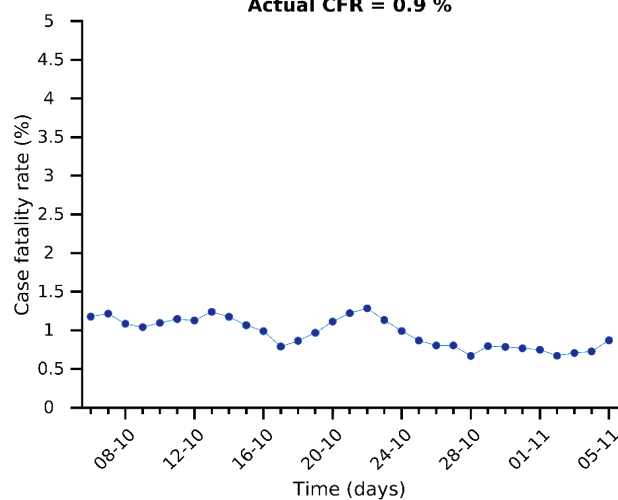
BIOCOM-Cov2 Degree = 9



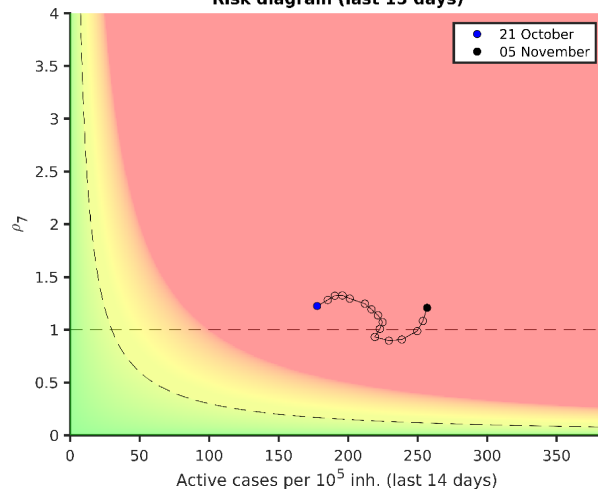
Actual $\rho_7 = 1.2$



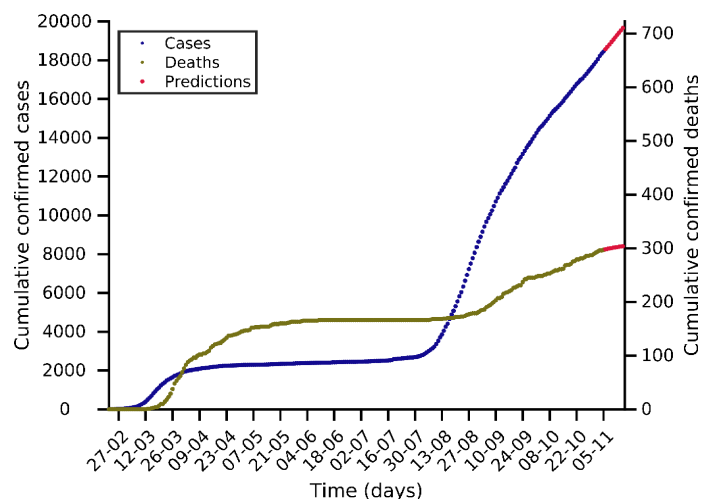
Actual CFR = 0.9 %



Risk diagram (last 15 days)



Canarias 05-11-2020. Pop: 2.2M. Cumulative incidence: 857/10⁵

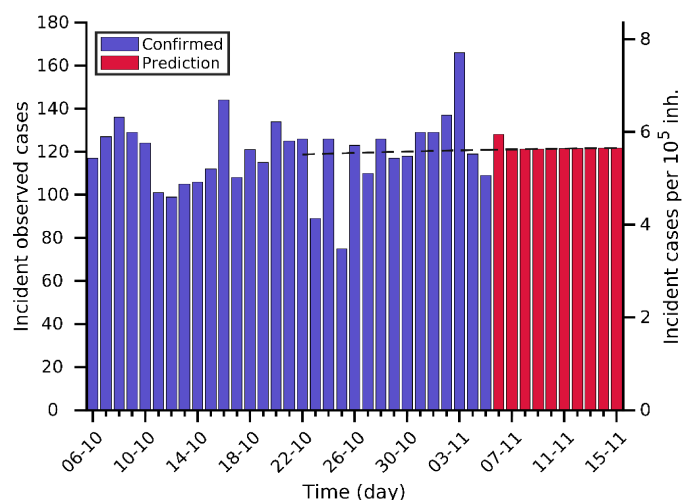


Predictions for next days

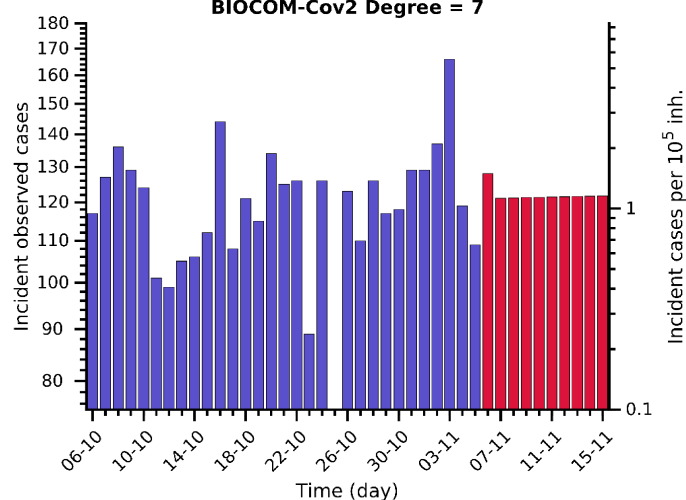
Day	Number of cases	95% Confidence Interval
08-11-2020	18818 (+370)	[18585 - 19052]
12-11-2020	19304 (+856)	[18784 - 19824]
15-11-2020	19669 (+1221)	[18681 - 20657]

Current indicators

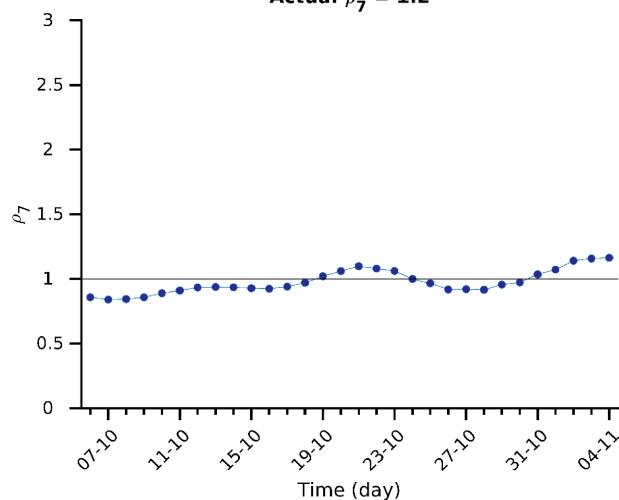
	A14	EPG	CFR	N7	D7
Today	78	90	1.09 %	130	1
A Week ago	76	70	1.28 %	109	1
Maximum	180	200	4.80 %	291	7



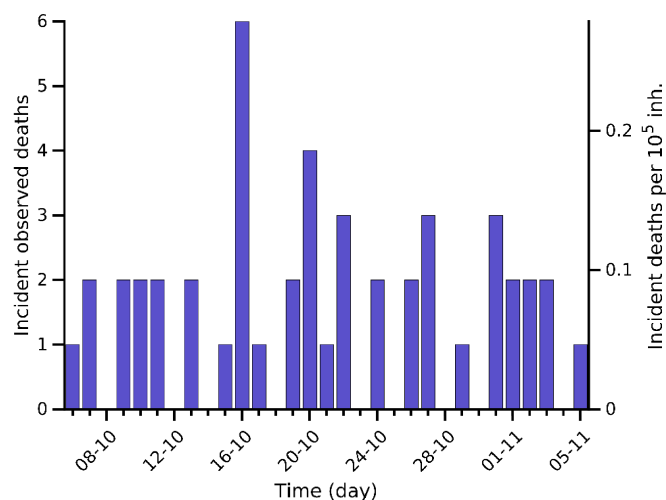
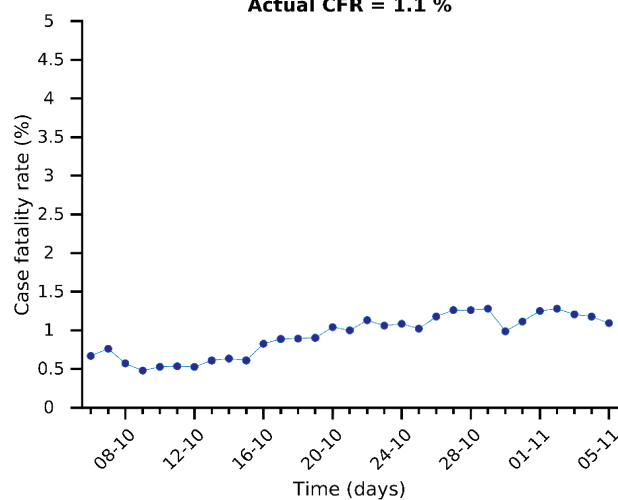
BIOCOM-Cov2 Degree = 7



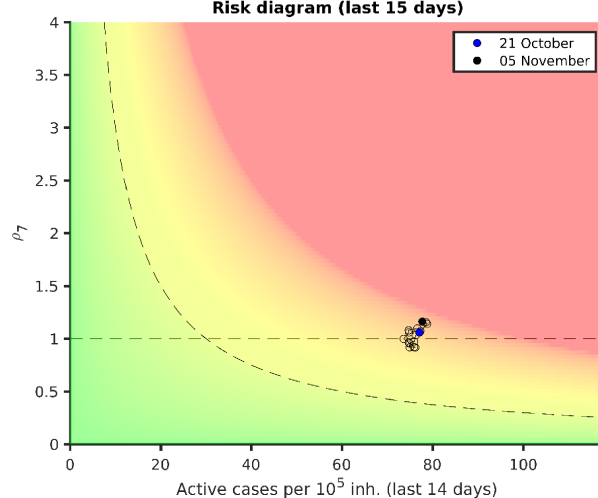
Actual $\rho_7 = 1.2$



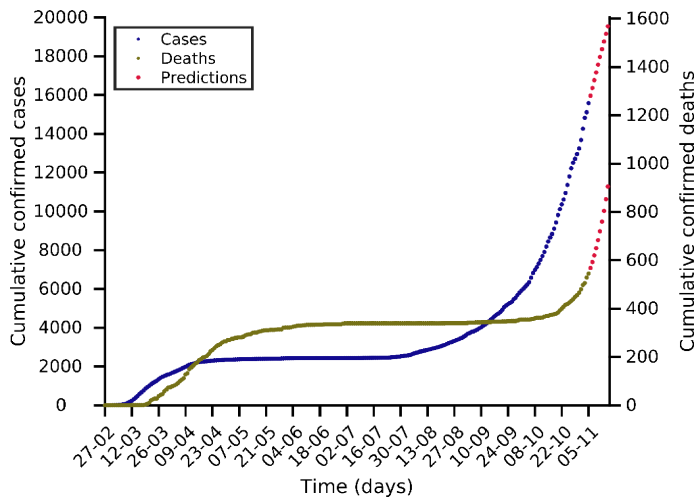
Actual CFR = 1.1 %



Risk diagram (last 15 days)



Asturias 05-11-2020. Pop: 1.0M. Cumulative incidence: 1524/10⁵

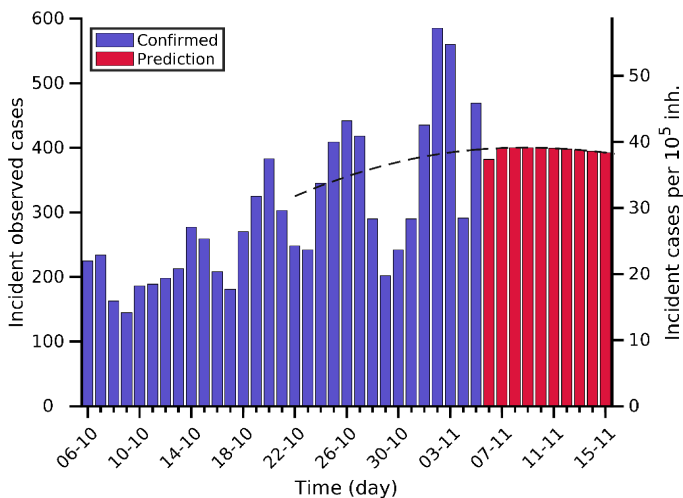


Predictions for next days

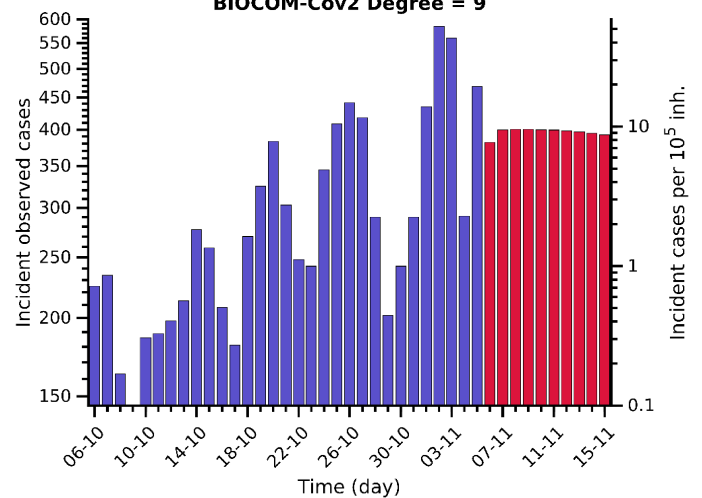
Day	Number of cases	95% Confidence Interval
08-11-2020	16766 (+1182)	[15766 - 17766]
12-11-2020	18364 (+2780)	[16249 - 20478]
15-11-2020	19548 (+3964)	[15700 - 23396]

Current indicators

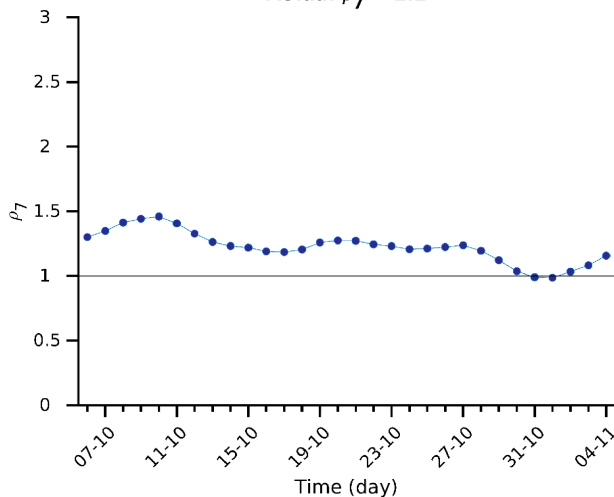
	A14	EPG	CFR	N7	D7
Today	510	590	5.72 %	410	14
A Week ago	417	498	4.48 %	335	7
Maximum	510	590	4.61 %	410	14



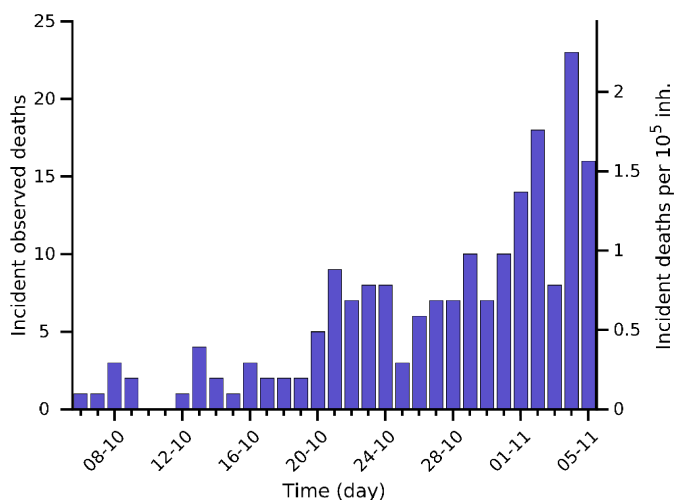
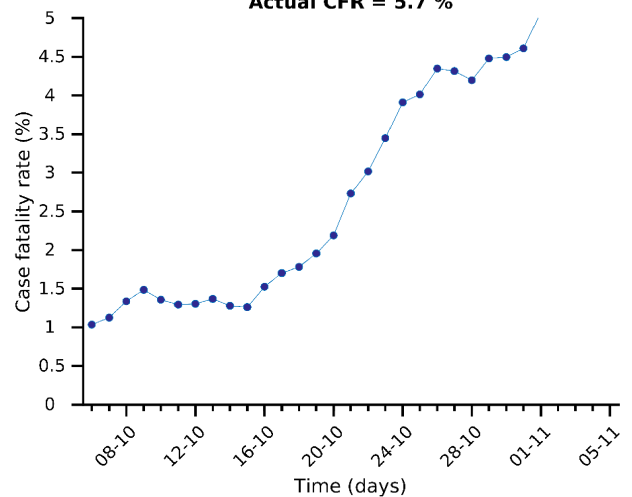
BIOCOM-Cov2 Degree = 9



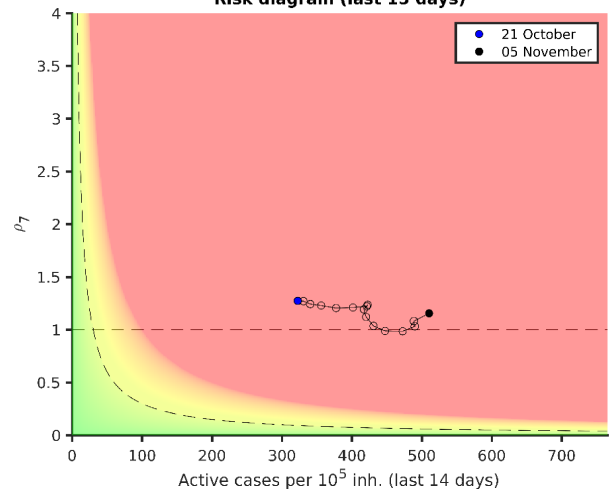
Actual $\rho_7 = 1.2$



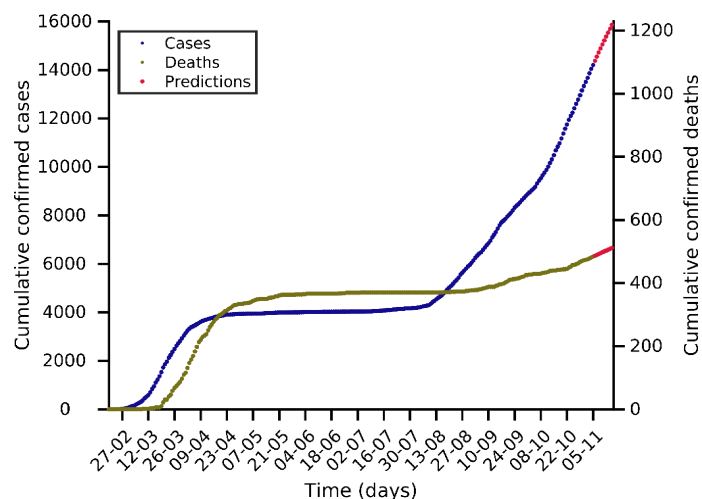
Actual CFR = 5.7 %



Risk diagram (last 15 days)



La Rioja 05-11-2020. Pop: 0.3M. Cumulative incidence: 4484/10⁵

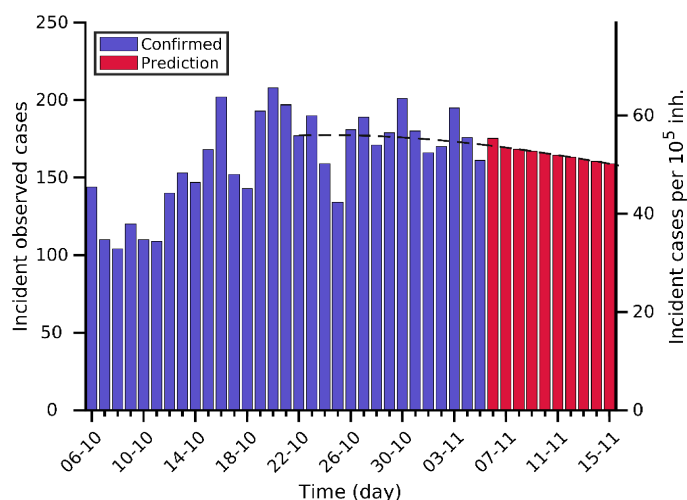


Predictions for next days

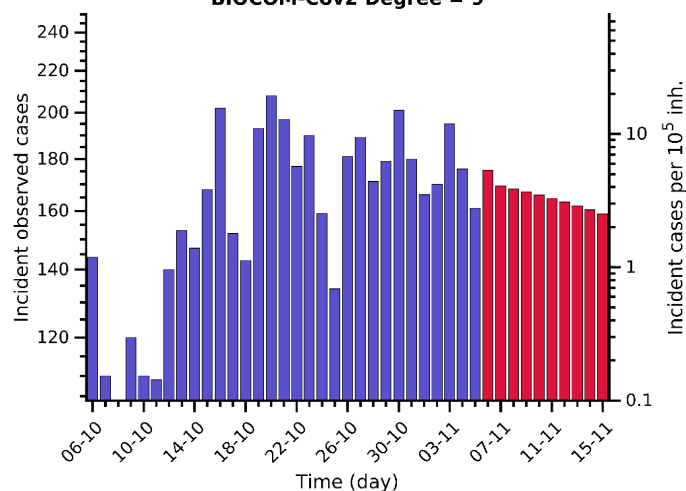
Day	Number of cases	95% Confidence Interval
08-11-2020	14718 (+513)	[14591 - 14845]
12-11-2020	15379 (+1174)	[15119 - 15639]
15-11-2020	15860 (+1655)	[15391 - 16328]

Current indicators

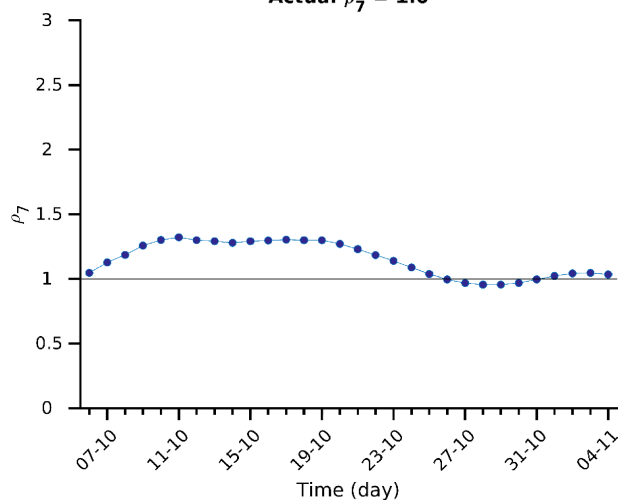
	A14	EPG	CFR	N7	D7
Today	774	801	2.44 %	178	2
A Week ago	781	747	2.23 %	172	3
Maximum	797	862	4.88 %	182	14



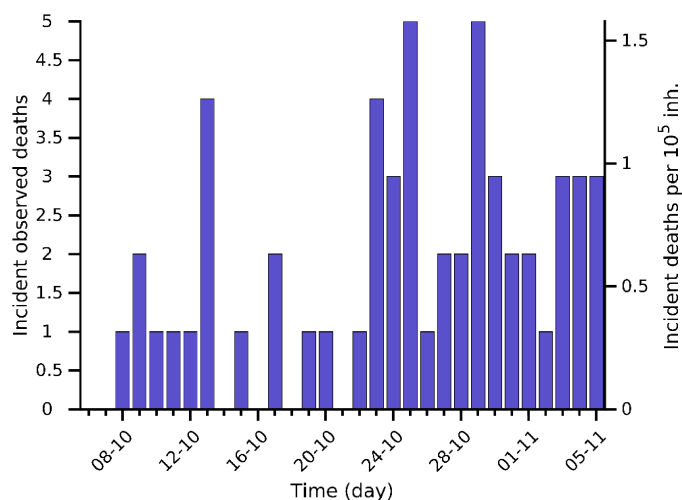
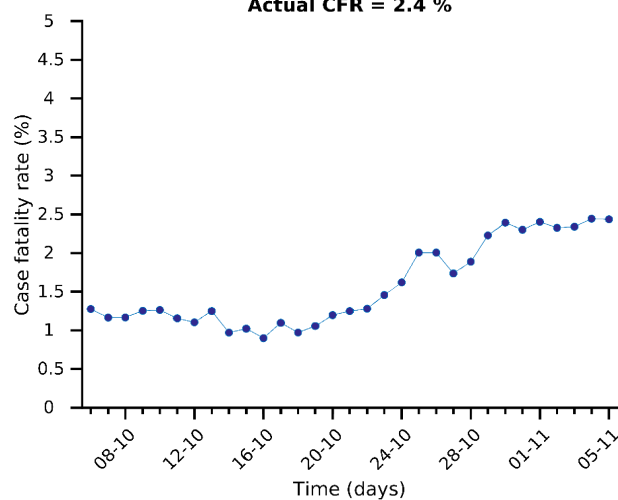
BIOCOM-Cov2 Degree = 9



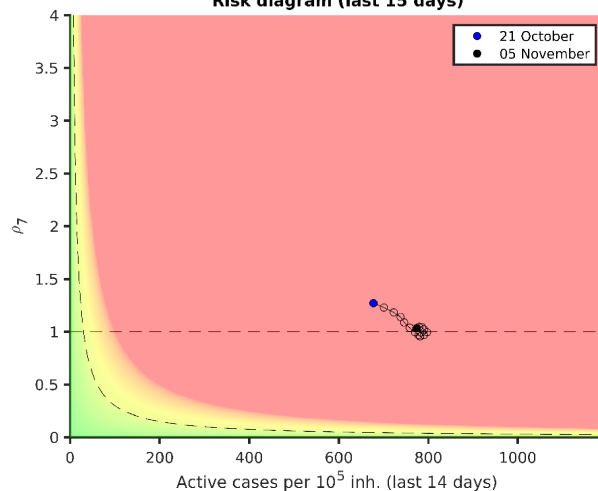
Actual $\rho_7 = 1.0$



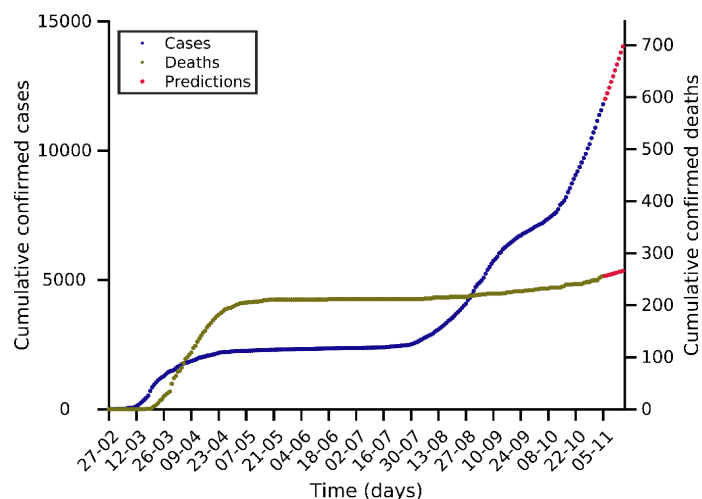
Actual CFR = 2.4 %



Risk diagram (last 15 days)



Cantabria 05-11-2020. Pop: 0.6M. Cumulative incidence: 2031/10⁵

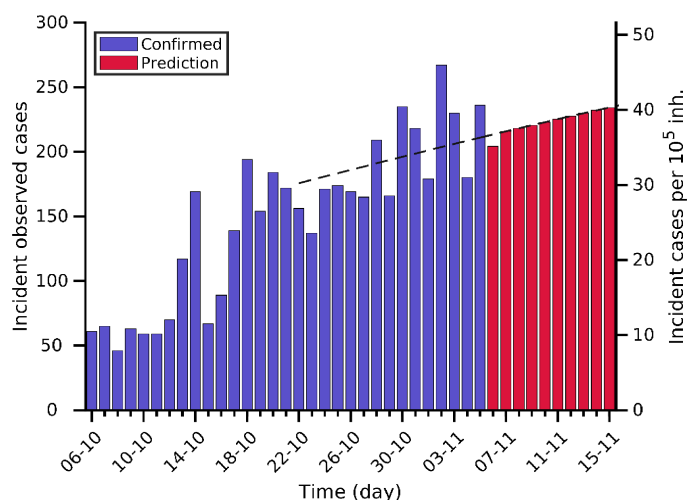


Predictions for next days

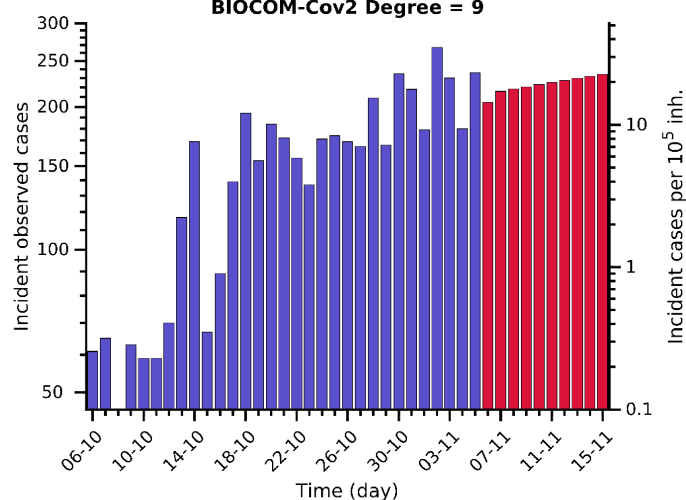
Day	Number of cases	95% Confidence Interval
08-11-2020	12439 (+638)	[12095 - 12783]
12-11-2020	13335 (+1534)	[12522 - 14149]
15-11-2020	14032 (+2231)	[12442 - 15621]

Current indicators

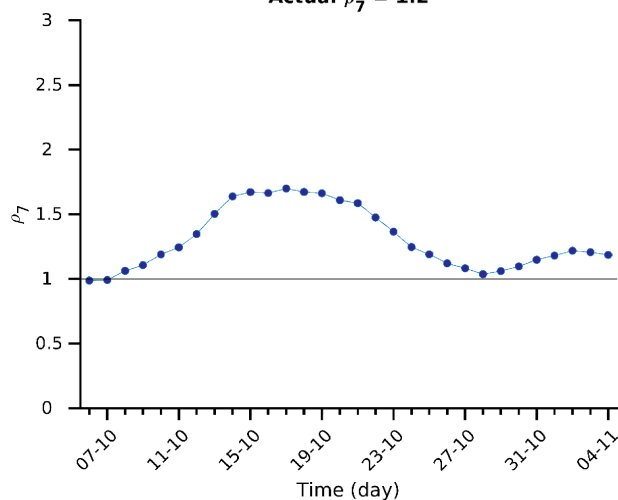
	A14	EPG	CFR	N7	D7
Today	471	558	1.63 %	221	2
A Week ago	392	407	1.38 %	170	1
Maximum	471	558	4.76 %	221	8



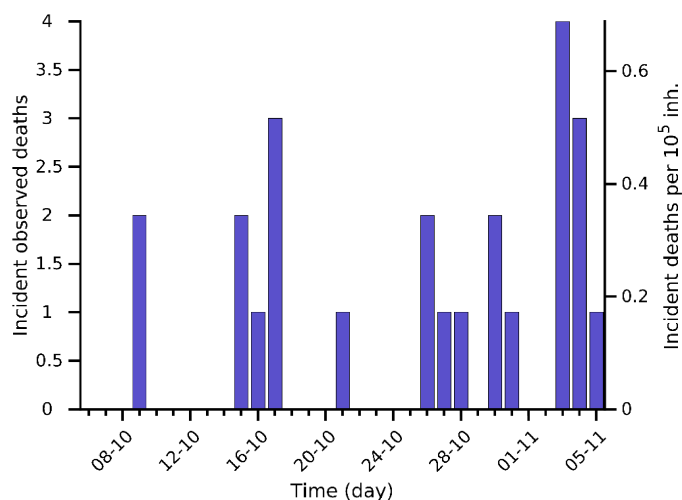
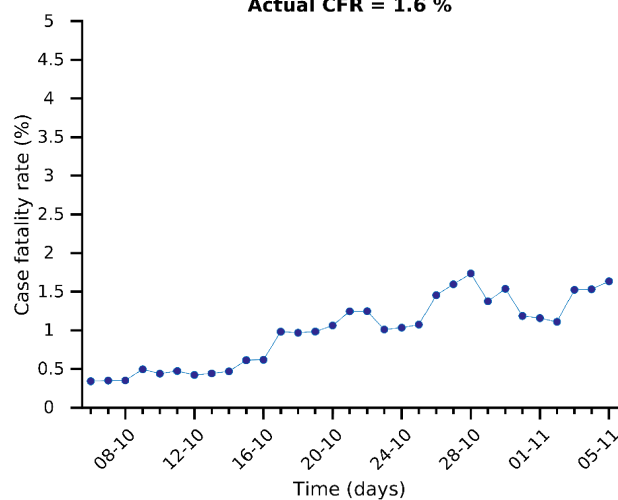
BIOCOM-Cov2 Degree = 9



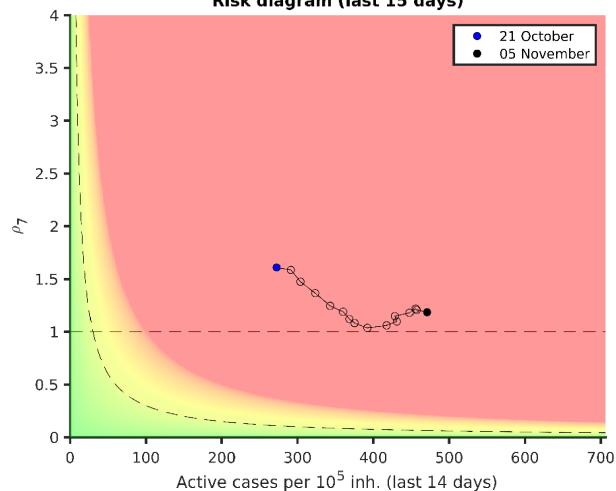
Actual $\rho_7 = 1.2$



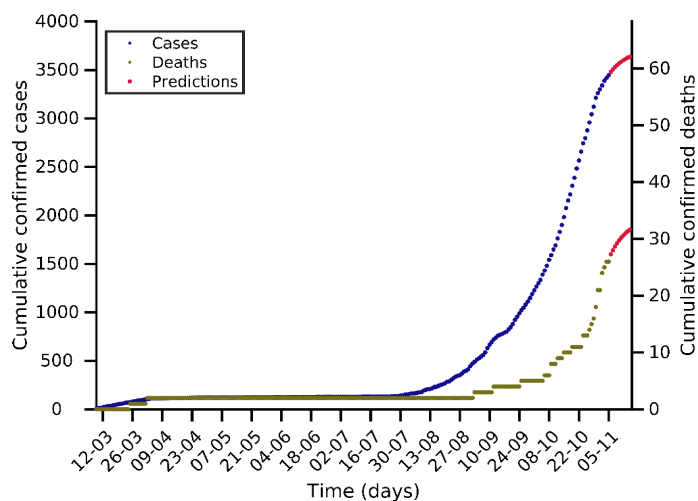
Actual CFR = 1.6 %



Risk diagram (last 15 days)



Melilla 05-11-2020. Pop: 0.1M. Cumulative incidence: 3984/10⁵

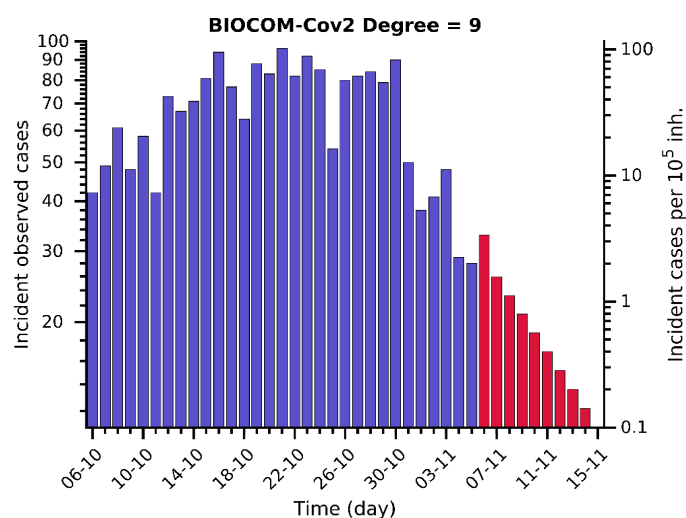
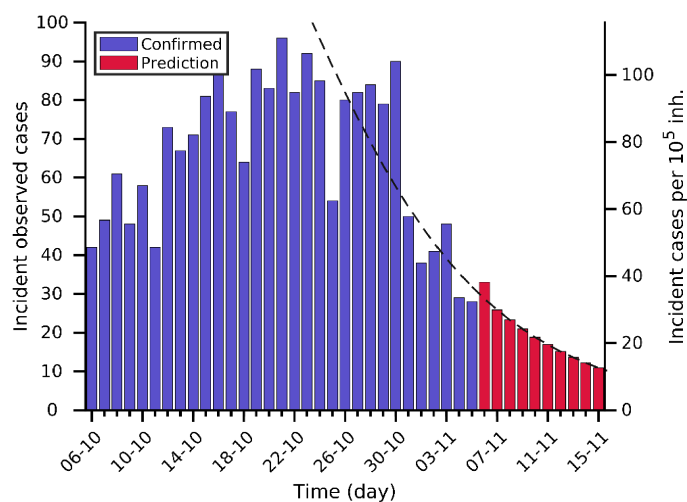


Predictions for next days

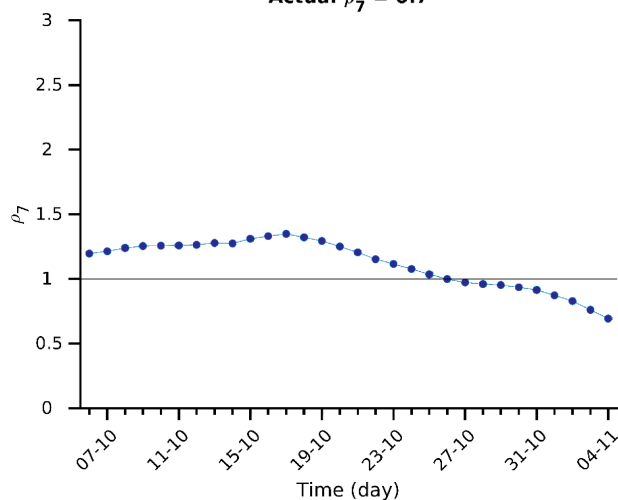
Day	Number of cases	95% Confidence Interval
08-11-2020	3528 (+82)	[3446 - 3651]
12-11-2020	3600 (+154)	[3449 - 3751]
15-11-2020	3637 (+191)	[3454 - 3819]

Current indicators

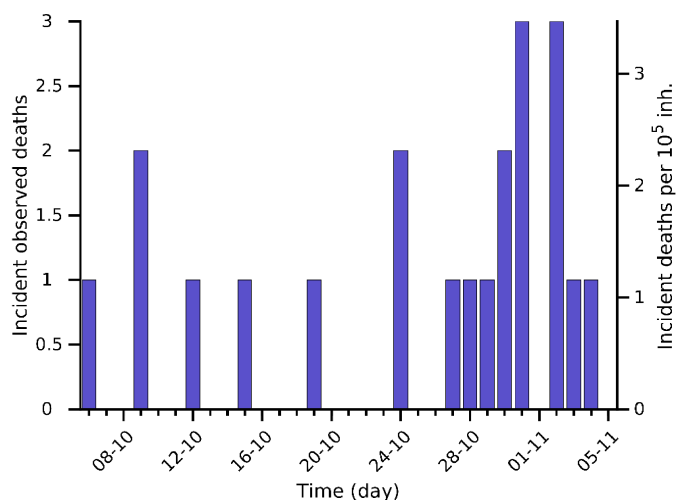
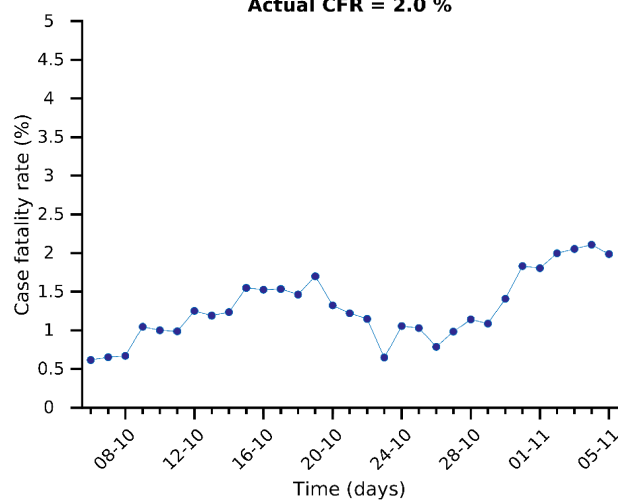
	A14	EPG	CFR	N7	D7
Today	1017	705	1.99 %	46	1
A Week ago	1318	1266	1.09 %	79	1
Maximum	1320	1450	4.88 %	84	2



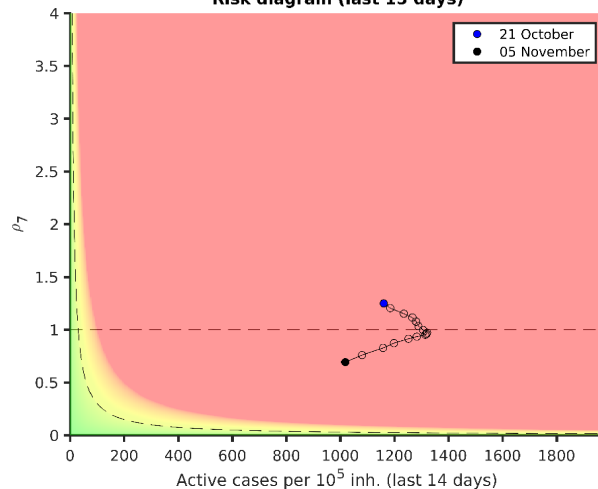
Actual $\rho_7 = 0.7$



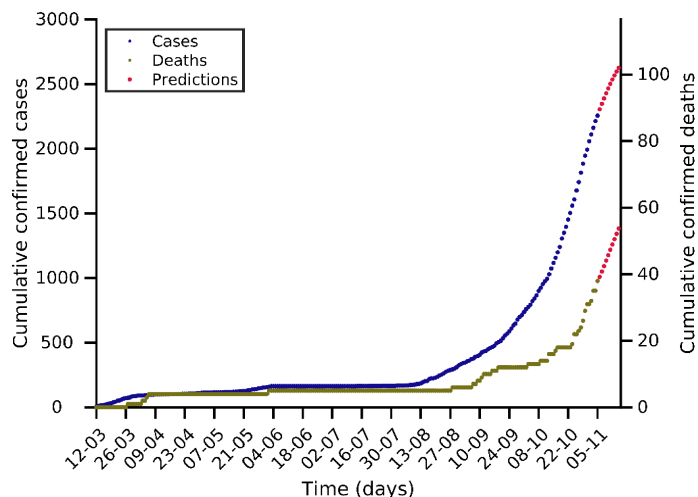
Actual CFR = 2.0 %



Risk diagram (last 15 days)



Ceuta 05-11-2020. Pop: 0.1M. Cumulative incidence: 2661/10⁵

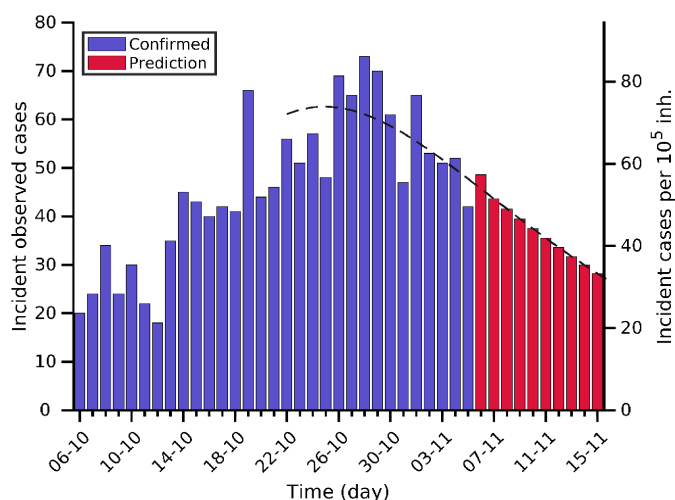


Predictions for next days

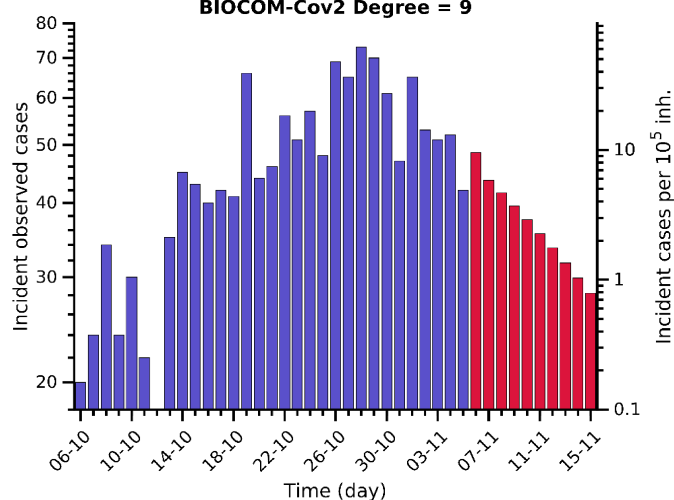
Day	Number of cases	95% Confidence Interval
08-11-2020	2390 (+134)	[2333 - 2446]
12-11-2020	2536 (+280)	[2473 - 2598]
15-11-2020	2626 (+370)	[2557 - 2695]

Current indicators

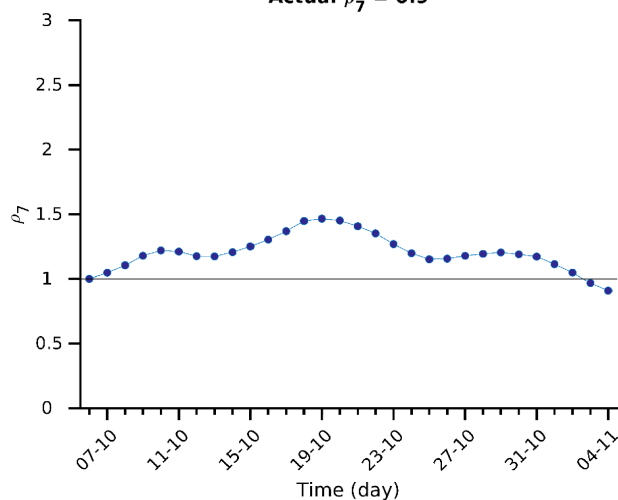
	A14	EPG	CFR	N7	D7
Today	948	862	5.25 %	53	2
A Week ago	906	1082	3.21 %	62	1
Maximum	965	1131	4.94 %	64	2



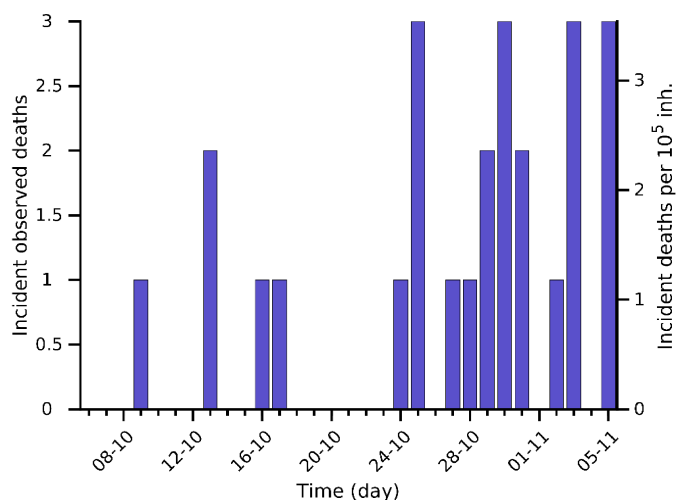
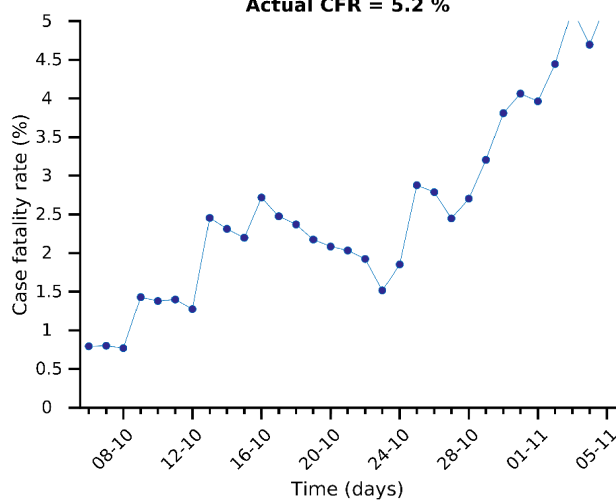
BIOCOM-Cov2 Degree = 9



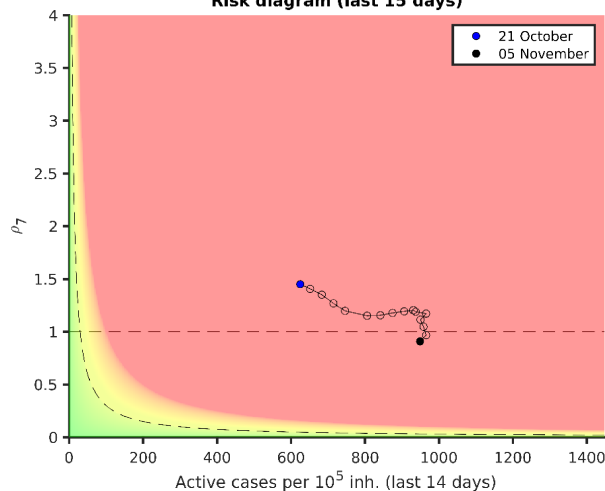
Actual $\rho_7 = 0.9$



Actual CFR = 5.2 %



Risk diagram (last 15 days)



Methods

Methods

(1) Data source

Data are daily obtained from European Centre for Disease Prevention and Control (ECDC)¹ and country official sources (when indicated). Daily data comprise, among others: total confirmed cases, total confirmed new cases, total deaths, total new deaths. It must be considered that the report is always providing data from previous day. In the document we use the date at which the datapoint is assumed to belong, i.e., report from 15/03/2020 is giving data from 14/03/2020, the latter being used in the subsequent analysis.

(2) Data processing and plotting

Data are initially processed with Matlab in order to update timeseries, i.e., last datapoints are added to historical sequences. These timeseries are plotted for individual countries and for the UE+EFTA+UK as a whole:

- ✓ Number of cumulative confirmed cases
- ✓ Number of reported new cases
- ✓ Number of cumulative deaths

Then, two indicators are calculated and plotted, too:

- ✓ Case fatality rate: number of cumulative deaths divided by the number of cumulative confirmed cases, and reported as a percentage; it is an indirect indicator of the diagnostic level.
- ✓ ρ : this variable is related with the reproduction number, i.e., with the number of new infections caused by a single case. It is evaluated as follows for the day before last report ($t-1$):

$$\rho(t-1) = \frac{N_{new}(t) + N_{new}(t-1) + N_{new}(t-2)}{N_{new}(t-5) + N_{new}(t-6) + N_{new}(t-7)}$$

where $N_{new}(t)$ is the number of new confirmed cases at day t after applying a 7-day moving average to the new cases dataset, so that fluctuations (e.g., weekend effect) are smoothed.

(3) Classification of countries according to their epidemic level: the scale Biocom-Cov

Countries are assigned a degree in the discrete Biocom-Cov scale, which aims to facilitate a simple way of assessing the situation of the country. It is based on the level of daily new cases per 100,000 inhabitants as follows:

Pandemic degree	Daily new incident cases per 10 ⁵ inh.
0	0
1	0-0.1
2	0.1-0.5
3	0.5-1.25
4	1.25-2
5	2-3
6	3-5
7	5-8
8	8-14
9	>14

¹ <https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases>

(4) Fitting a mathematical model to data

Previous studies have shown that Gompertz model² correctly describes the Covid-19 epidemic in all analysed countries. It is an empirical model that starts with an exponential growth but that gradually decreases its specific growth rate. Therefore, it is adequate for describing an epidemic wave that is characterized by an initial exponential growth but a progressive decrease in spreading velocity provided that appropriate control measures are applied. Once in the tail, predictions work but the meaning of parameters is lost.

Gompertz model is described by the equation:

$$N(t) = K e^{-\ln\left(\frac{K}{N_0}\right) \cdot e^{-a \cdot (t-t_0)}}$$

where $N(t)$ is the cumulated number of confirmed cases at t (in days), and N_0 is the number of cumulated cases the day at day t_0 . The model has two parameters:

- ✓ a is the velocity at which specific spreading rate is slowing down;
- ✓ K is the expected final number of cumulated cases at the end of the epidemic.

This model is fitted to reported cumulative cases of the UE and of countries that accomplish two criteria: 4 or more consecutive days with more than 100 cumulated cases, and at least one datapoint over 200 cases. Day t_0 is chosen as that one at which $N(t)$ overpasses 100 cases. If more than 15 datapoints that accomplish the stated criteria are available, only the last 15 points are used. The fitting is done using Matlab's Curve Fitting package with Nonlinear Least Squares method, which also provides confidence intervals of fitted parameters (a and K) and the R^2 of the fitting. At the initial stages the dynamics is exponential and K cannot be correctly evaluated. In fact, at this stage the most relevant parameter is a .

It is worth to mention that the simplicity of this model and the lack of previous assumptions about the Covid-19 behaviour make it appropriate for universal use, i.e., it can be fitted to any country independently of its socioeconomic context and control strategy. Then, the model is capable of quantifying the observed dynamics in an objective and standard manner and predicting short-term tendencies.

(5) Using the model for predicting short-term tendencies

The model is finally used for a short-term prediction of the evolution of the cumulated number of cases (3-5 days). The confidence interval of predictions is assessed with the Matlab function `predint`, with a 99% confidence level. These predictions are shown in the plots as red dots with corresponding error bar. For series longer than 9 timepoints, last 3 points are weighted in the fitting so that changes in tendencies are well captured by the model.

(6) Estimating non-diagnosed cases

Lethality of Covid-19 has been estimated at around 1 % for Republic of Korea and the Diamond Princess cruise. Besides, median duration of viral shedding after Covid-19 onset has been estimated at 18.5 days for non-survivors³ in a retrospective study in Wuhan. These data allow for an estimation of total number of cases, considering that the number of deaths at certain moment should be about 1 % of total cases 18.5 days before. This is valid for estimating cases of countries at stage II, since in stage I the deaths would be mostly

² Madden LV. Quantification of disease progression. *Protection Ecology* 1980; **2**: 159-176.

³ Zhou et al., 2020. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *The Lancet*; March 9, doi: 10.1016/S0140-6736(20)30566-3

due to the incidence at the country from which they were imported. We establish a threshold of 50 reported cases before starting this estimation.

Reported deaths are passed through a moving average filter of 5 points in order to smooth tendencies. Then, the corresponding number of cases is found assuming the 1 % lethality. Finally, these cases are distributed between 18 and 19 days before each one.